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### GOLD MEDAL PRIZE ESSAY.

"LESSONS TO BE DERIVED FROM THE OPERATIONS OF LANDING AN EXPEDITIONARY FORCE ON AN ENEMY'S COAST IN PAST WARS, WITH SPECIAL REFERENCE TO SIMILAR OPERATIONS ON THE PART OF OUR ARMY IN THE FUTURE."

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## GOLD MEDAL PRIZE ESSAY.

## SECTION I.—INTRODUCTORY.

**T**HE whole subject of the landings of expeditionary forces is so complex, and so much, of necessity, depends on matters of circumstance, and detail of all kinds, that it is with the greatest diffidence that any attempt is made to treat of it in a necessarily short sketch.

For the right understanding of the causes of success or failure in any particular case, it is necessary to search beyond the mere appearance of things on the surface, and to take into account the political situation at the moment, the nature and extent of the command of the sea possessed by one or other of the belligerents, the characters of the members of the Government, whether energetic or supine, wise or the reverse, and its position, whether strong or weak. The personal characters of the admirals and generals to whom the conduct of the expedition has been entrusted, the *morale* and state of health of the individuals comprising it—all these have to be duly weighed, and their influence taken into account. And when to all this is added the wonderful variety, caused by geographical and local circumstances, with their immediate and direct bearing on operations of this nature, it will be seen that the subject is one of great breadth and of considerable difficulty.

The conduct of an expedition across the seas may, in fact, be said to form a special branch of the art of War. We have numerous works treating of land warfare, and numerous others treating of naval operations, yet the particular kind of service we are now considering—a combination of the two—has but little literature of its own, and this causes its study to be less common than that of either naval or military history taken separately. From our insular position, it seems that the records of past achievements, in which both Navy and Army have shared the work, are of interest to both sailor and soldier alike, and deserve to be more widely studied by both branches of the Service. Another cause of the paucity of literature on this subject is that the Continental nations, as a rule, have little experience of such combined operations.

They are special, because depending entirely for success upon the co-operation of the Navy and Army, each of whom, moreover, are placed at a distinct disadvantage, the sailors being hampered and employed in strange duties, such as the convoying of transports, and the necessary work connected with the embarkation and disembarkation of the troops, their horses, guns, and stores; the soldiers, out of their element on board ship, more or less helpless until put ashore, and liable to temporary loss of spirits and energy due to sea-sickness and other causes—their guns and stores difficult to get at, and their horses losing condition

while at sea; and special, because requiring a more complex and difficult preparation than is necessary for either a purely land or a purely sea expedition.

The fact that at the date of writing this (September, 1894) a war on a large scale is in progress between Japan and China—the one an insular nation like ourselves—makes it quite possible that, before this is read, some great event may take place which may throw new and clear light on the problems now being discussed.

So far as it has gone, we can already see in the sinking of the Chinese transport the "Kow Shing" by a Japanese cruiser, and in the narrow escape of the Chinese reinforcements for their army in the Korea, which were being landed, covered by the Chinese Fleet, when the latter was overtaken by the Japanese Fleet at the mouth of the Yalu River, how precarious must be any attempt to convey troops across the sea unless the nation sending the expedition has full and undisputed command of that sea.

This point has been already proved by Admiral Colomb in his work "Naval Warfare," and the instances above quoted only serve to still further corroborate and illustrate his conclusions.

Before entering into any matter of detail connected with such operations, it is desirable to look at the subject in its broadest aspect.

The landing of a body of armed men on an enemy's coast may be anything from the landing of a few boatloads of men to carry out some special operation, such as a small raid, or as a preliminary to a later landing in force, up to a large operation of War, carried out with all the combined wisdom and experience of high naval and military authorities, and supported by immense resources.

The preliminaries to the actual landing must necessarily be considered, as well as the circumstances of the landing itself.

They are in character partly political, partly administrative, partly strategical, and partly tactical.

The selection of the Region where the landing is to be effected is governed by political requirements.

It is merely necessary to mention as instances the British expedition to Egypt in 1801, the object of which was to expel the French from that country, or our expedition to the same country in 1882, to prevent it from falling into the hands of those who would be hostile to British interests.

The region being determined upon, the actual point of landing is selected upon combined strategical and tactical grounds, and of course, providing that the objective can be obtained, will be governed by what may be termed the "line of least resistance" of the enemy, so far as it can be ascertained from the information available as to his strength and disposition; by the facilities for disembarkation, and pushing forward to the objective after the disembarkation; and by the presence or absence of water, supplies, and transport. Upon the character of the country and its inhabitants, and upon the nature of the objective, depend the size and composition of the expedition, both as regards its total numbers and the relative numbers of each arm it contains.

It must appear from a general survey of the past that the size of an expedition across the seas should be comparatively limited, at any rate as compared with the enormous size of modern land armies.

The magnitude of the necessary arrangements, and the time required for the preliminary preparations, increase in a more and more rapid ratio as the size of the expedition is increased, while the difficulties of successfully dealing with very large forces, subdivided among numerous vessels, the troops out of their element on the sea, and probably before full co-operation between the naval and military authorities is thoroughly established, must be very great, to say nothing of the immense weight of responsibility which a very large expedition must throw upon its commander when such a risky operation as landing upon an enemy's coast has to be accomplished. If the number of men to be thrown on the enemy's coast be very large, the force should be organised into more than one Army Corps, each complete in itself, and each to effect its own landing.

Probably one of the largest expeditions ever successfully landed on a distant and hostile coast was that of the allies to the Crimea in 1854, to which it will be necessary to refer again later. In this case a grand total of no less than 63,000 men and 128 guns were successfully landed at one time on the shores of an enemy's country.

But the circumstances were very special. In the first place this army was really composed of three separate armies—English, French, and Turkish. Each of these practically effected a separate landing, although they acted in concert so far as place and date were concerned.

The supplies, etc., for each of these forces were cared for by the nation furnishing the contingent—the strain and responsibility, therefore, of the supply did not fall entirely upon any one man, or group of men, but was distributed over the area and resources of three kingdoms.

Again, the enemy, on whose shores the expedition was thrown, showed a quite remarkable inertness, and made no attempt to oppose the landing near Eupatoria. On the whole it can hardly be argued that because this particular landing was successfully effected, that therefore it will always be as easy to carry out with success the landing of an expedition of this size upon an enemy's shore.

Moreover, it must be borne in mind that unless the country immediately around the point of disembarkation be sufficiently rich to sustain the entire force placed on shore, from the moment of disembarkation, the expedition will be practically tied to the beach until sufficient stores and transport can be accumulated to permit of an advance.

Large forces require great quantities of supplies, entailing great fleets of transports, considerable labour and time in getting ashore, taking up much wharf space, and necessitating arrangements on a large scale for distribution and transport to depôts immediately after landing.

The destination, size, and composition of the expedition being determined upon, the next point is the selection of the commander to whom its conduct is to be entrusted. Although this is of the highest importance always, and in the case of all operations, yet in no kind of



warfare is it so absolutely necessary that the commander should be in touch with, and possess the confidence of his officers and men; and, further, that he should be capable of getting on well with the officers of the Navy who are associated with him in the enterprise. He must be a man of decision of character, of sound judgment, and, while capable of seeing dangers so as to take measures to meet them, must not be over-cautious or timid.

As none of the details of landing operations have as yet been considered, the present seems a fitting place to give a short history of an expedition which, although it never reached its culminating point, yet furnishes most valuable lessons. It is probable, indeed, that failure always teaches far more than success; but most unfortunately for those anxious to profit by the experiences of others, the records of failures are generally more or less buried in oblivion.

Recognising that for any deductions to carry conviction to the mind, the grounds on which they are based must be clearly put forward, it is thought best to describe, very shortly, each of the operations from which it is proposed to draw inferences, and then to sum up the results of these inferences, before considering their application to the possibilities of the future.

It appears to be most satisfactory to arrange the various instances, here quoted, in chronological order simply, irrespective of the nationalities of the belligerents, or other possible methods of classification. This method has the great advantage of enabling the reader to trace connections between the different expeditions undertaken at different times, and to see how the faults most apparent in any one of them have generally been avoided in the next.

As a general rule, no attempt has been made to follow the fortunes of the various expeditions after they were once established on the shore, their after operations not being considered to come within the scope of this paper.

## SECTION II.—EXAMPLES FROM THE PAST.

### *Example No. 1.*

#### THE BRITISH EXPEDITION TO ROCHEFORT IN 1757.

*Authorities*—Burrow's "Life of Lord Hawke"; Wright's "Life of Wolfe"; "Cust's Annals." See sketch map, Plate I.

Many of the foregoing points are well illustrated by an abortive British expedition to Rochefort, which took place in 1757.

In that year a state of war existed with France, and Pitt, who had recently been made Prime Minister, with a great reputation for vigour and statesmanship, was desirous of making a descent on the French coast, for the double purpose of creating a diversion in favour of the Duke of Cumberland and the King of Prussia, who were operating on land, and also to dispel the panic fear of a French invasion, which then existed in this country.

An English officer named Clarke, who had travelled through western France, three years previously, had reported that the fortress of Rochefort

was in a neglected state, and that it would be quite possible to destroy the shipping in the harbour, as well as the stores.

Pitt determined upon this operation, and, deeming every circumstance to concur in favour of a surprise, although the season—mid July—was far advanced for the commencement of such an enterprise, he immediately took the necessary steps.

Under his vigorous administration, the speed and magnitude of the preparations were unprecedented, while the secrecy with which the destination of the armament was preserved made its object a subject of general speculation.

The ships were ordered to take on board provisions for six months, and large numbers of men were impressed at every seaport, no less than 2,000 men being impressed on the Thames alone.

Scaling ladders, which could be instantly fixed, and so constructed that thirty men might mount abreast, were prepared, and every transport was to have ten boats, each capable of holding thirty men, so that the entire force might land at once.

The fleet consisted of sixteen sail of the line, besides frigates, etc., under Sir Edward Hawke.

The land force consisted of 10,000 men under Lieut-General Sir J. Mordaunt, once a man alert and brave, but now infirm in body and mind.

By the 10th August, 1757, the army was collected in the Isle of Wight, and prepared to embark, but the transports were not ready. They arrived on September 6th, when the troops embarked, having with them abundant stores, and, in short, nothing seemed wanting to ensure success.

The expedition departed in ignorance of its destination, and had been a week at sea before being informed of the design, which was the destruction of Rochefort; but should that place prove too strong they were to seek an opening elsewhere, and spread alarm along the coast.

On September 30th, 1757, the expedition made the land off the Isle of Rhé.

That afternoon a division of the fleet was ordered to enter the *pertuis*, between the Isle of Rhé and Oleron, to see what anchorage there was for the fleet, but the reconnaissance was interrupted by the sudden appearance of a large French man-of-war, homeward bound, from abroad, which unwittingly bore down into the middle of the fleet. The reconnoitring division, abandoning the reconnaissance, pursued nearly to Bordeaux, but the chase got away. The escape of this ship was of importance, as she gave the alarm; and the firing of guns and making of smokes and bonfires, all along the coast, showed that the enterprise was detected.

On 21st September it was resolved to anchor the fleet in the Channel between Rhé and Oleron, but just as they had weighed to do so the wind took them aback, and the movement could not be carried out. By 22nd September the fleet was at anchor between Rhé and Oleron, the ships immovable in a dead calm, waiting for a breeze to bear down upon the Ile d'Aix, which was in sight.

On September 23rd, a gallant naval demonstration of five ships,

headed by Captain Howe in the "Magnanime," was made against the fort of Aix. "Mr. Howe," as Wolfe, who was on the staff of the expedition, quaintly calls him, attacked with great gallantry and dash, and poured such a fire into the fort that it struck after only thirty-five minutes' resistance, leaving thirty guns and eight mortars, and was occupied by a landing party.

Meanwhile the land forces remained idle, but young Wolfe—afterwards the hero of Quebec, then a Major on the staff of Sir J. Mordaunt—unwilling that the whole of the honours of the expedition should be carried off by the Navy, prevailed upon his chief to allow him to reconnoitre the coast with a view to the disembarkation of troops.

A scheme was drawn up, the admiral sent a rear-admiral and three captains to verify the reconnaissance, so far as the landing places were concerned. They returned on the 24th, when the admiral, "after mature consideration," was of opinion that they might land.

Sir J. Mordaunt, however, faint of heart and unwilling to incur responsibility, now called a council of war, which resolved, that it appeared that the troops could not be re-embarked in bad weather; also that, in case of being overpowered by the enemy, the troops would have no protection from the guns of the fleet, owing to the shoal water preventing their near approach; that owing to these hindrances, together with the long detention in the Isle of Wight, the delays caused by fogs, calms, and contrary winds upon the passage, and the information to hand as to the assembling of French forces in the neighbourhood, there was a great improbability of finding Rochefort unprepared, the court was unanimously of opinion that such an attempt was neither advisable nor practicable.

To this faint-hearted resolution the admiral afterwards justified his assent, upon the grounds of his confidence in the judgment of the land officers and their superior knowledge of their own profession.

But after the passing of this resolution, which, right or wrong, should have been final, and after two more days had been wasted in further consultations, it was at length resolved, "after mature deliberation," to land the troops with all possible despatch.

At midnight on 28th September, 1757, therefore, the troops were actually disembarked from the transports into the boats; but after tossing about for three hours a cutter brought orders that all were to re-embark on shipboard.

The reasons given for this were conflicting, the naval officers stating that the general suddenly concluded not to land, the military officers affirming that the sea had risen, and that the naval officers had stated that a landing should not be attempted.

The following day the general was informed by the admiral that if the former had no further military operation to propose, sufficient to authorise his detaining the fleet, he must return to England immediately.

The general wished to assemble a third council of war, which the admiral declined to attend, saying that seamen were not judges of operations proposed to be carried out by troops on shore, and the whole force returned to England.

Thus ingloriously ended an expedition which had drawn the attention of all Europe, which had thrown the French Court into great terror, and which had cost the nation a million of money—an expedition well prepared and well planned, and which, if entrusted to a vigorous chief, should have had every prospect of success.

COMMENTS.—What better comments could possibly be given than the words of one who, as quartermaster-general of the abortive expedition, and with the whole of its conduct fresh in his mind, thus writes in a private letter to a personal friend, barely a month after his return to England?

On the 5th November, 1757, Wolfe writes :—

“I am not sorry that I went, notwithstanding what has happened. One may always pick up something useful from among the most fatal errors. I have found out that an admiral should endeavour to run into an enemy's port immediately after he appears before it ; that he should anchor the transport ships and frigates as close as he can to the land ; that he should reconnoitre and observe it as quick as possible, and lose no time in getting the troops on shore ; that previous directions should be given in respect to landing the troops, and a proper disposition made for the boats of all sorts, appointing leaders and fit persons for conducting the different divisions. On the other hand, experience shows me that, in an affair depending upon vigour and despatch, the generals should settle their plan of operations so that no time may be lost in idle debate and consultations when the sword should be drawn ; that pushing in smartly is the road to success, and more particularly so in an affair of this nature ; that nothing is to be reckoned an obstacle to your undertaking, which is not found to be really so upon trial ; that in war something must be allowed to chance and fortune, seeing it is, in its nature, hazardous and an option of difficulties ; that the greatness of an object should come under consideration, opposed to the impediments that lie in the way ; that the honour of one's country is to have some weight ; and that in particular circumstances and times the loss of a thousand men is rather an advantage to the nation than otherwise, seeing that gallant attempts raise its reputation and make it respectable ; whereas the contrary appearances sink the credit of a country, ruin the troops, and create infinite uneasiness and discontent at home.”

The story of this expedition has purposely been related rather fully, as a striking example of how things should *not* be done, and as showing how little even the most complete preparations and vigorous administration at home avail, when neutralised by the non-agreement or the incompetence of those to whom the executive part of the task is entrusted.

The escape of the French man-of-war, and consequent warning of the coast, is an incident which will be seen to have parallels in other expeditions.

The dependence of the sailing vessels of those days upon wind and weather is clearly shown and the secrecy ensured by the use of sealed orders, not promulgated until after the expedition was at sea, is a point worth noting.

Sir J. Mordaunt was tried by court-martial for the failure of his expedition. The trial resulted in an acquittal, and it must be remembered that the late start, the unavoidable delays, the entire want of knowledge of the roadstead, anchorages, and landing places, and the probability of finding the place prepared, made his position a difficult one.

*Example No. 2.*

THE LANDING OF THE BRITISH FORCES, UNDER GENERAL AMHERST, AT CAPE BRETON ISLAND, JUNE 8th, 1758.

*Authority*—Wright's "Life of Wolfe." See sketch map, Plate No. II.

The constant success of the French Power in North America, since the year 1755, had made it evident that the French and English Powers could not long continue to co-exist in America. Mr. Pitt, undaunted by past failures, resolved that America should be the field of more extensive operation than had previously been attempted. His scheme for the campaign of 1758 comprised three objective points, of which we are here only concerned with one, viz., the reduction of the harbour of Louisburg, in Cape Breton Island, and the key to the River St. Lawrence.<sup>1</sup>

As this undertaking must necessarily embrace a combined naval and military expedition, and as this kind of expedition had hitherto been nearly always unsuccessful, the selection of proper commanders was of the first importance. None of the senior officers of the Army appeared up to the mark, and the claims of seniority being set aside, Colonel Amherst, who had distinguished himself in Germany, was recalled, promoted, and appointed to the command of the expeditionary force, which consisted of fourteen regiments and a fleet of about forty men-of-war, besides transports.

On June 2nd, 1758, the British expedition sighted Louisburg, and anchored in the Bay of Gabarouse. The same evening, in spite of a tremendous swell from the Atlantic and heavy surf, the shore was reconnoitred by the general and his brigadier in a small sloop, and dispositions were planned for the descent of the troops at daybreak next morning. But this was not to be; day after day storms and fogs frustrated every endeavour to land, and the troops, more than once embarked in their boats, had to return. In the meantime, the French were strengthening their position by every means in their power.

Louisburg, a land-locked harbour, now abandoned, but then of importance, contained the French Fleet, and was protected by forts to both land and seaward. All possible landing places, for several miles from the town, were put in a state of defence by breastworks and abattis with batteries at intervals.

At midnight, June 7th-8th, the sea abating, the troops were embarked, and with the first glimpse of dawn the guns of the fleet opened to cover the landing, after which the boats in three divisions made for the land, towards three different points. Five battalions rowed eastward, as if intending to land at White Point, Louisburg. Six battalions moved

<sup>1</sup> This harbour formed the starting point for the British Expedition of the following year, which ended in the capture of Quebec.

straight toward Freshwater Cove, as if intending to land there; but both these were with a view of diverting attention from the real attack on the left, consisting of a selected force of a strength of about four battalions.

This force was received with heavy fire from concealed batteries and musketry from behind the abattis, and the heavy surf dashed the boats against the rocks, upsetting and wrecking some, and drowning many men. There was, however, no thought of drawing back, and somehow or other the men succeeded in scrambling ashore, and forming upon the beach, immediately after which they stormed the enemy's posts with the bayonet. The next brigade, altering its course, landed at the same spot, as also did reinforcements from the fleet. The French were rolled up and driven into the town, leaving the invaders safely established on shore. The town was afterwards besieged and taken.

COMMENTS.—Again we are indebted to Wolfe—who on this occasion commanded, as Brigadier, the brigade which effected the first landing—for a comment of considerable value, because written only a few weeks after the enterprise. In a private letter he writes:—

“In general it may be said that we made a rash and ill-advised attempt to land, and by the greatest good fortune imaginable we succeeded. If we had known the country, and had acted with more vigour, half the garrison, at least (for they were all out), must have fallen into our hands immediately after we landed.”

It is interesting to see here, as in many other similar expeditions, the serious delay caused by the rough weather and surf, which gave the French ample time to prepare to resist the landing, whenever it might be attempted. In many ways there is considerable parallelism between this operation and another next to be related, viz., the British landing in Egypt in 1801. General Amherst probably felt himself constrained to act with great vigour, and fell into the mistake of over-rashness. He was aware of the great importance attached by the Government to the enterprise, to assume command of which he had been specially selected, and promoted over the heads of his seniors, many of whom were doubtless watching his proceedings with jealous eyes; and, more than all, he remembered the failure of the preceding year, and the disgrace which attended it.

These were probably the reasons of his taking the risks he did, and his action was justified by success.

### *Example No. 3.*

#### THE BRITISH EXPEDITION TO EGYPT IN 1801.

*Authorities*—Wilson's "History of the British Expedition to Egypt" (published 1803); Walsh's "Campaign in Egypt"; "Cust's Annals"; Sir J. Burgoyne's "Short History of the Naval and Military Operations in Egypt"; "The Egyptian Campaign of 1801," by Major S. C. Pratt, R.A. (Proceedings of R.A. Institution, Vol. XIII., No. 3).

Another striking contrast to the Rochefort expedition, and forty-four years later, is the intrepid landing of the British expedition to Egypt, under Sir Ralph Abercrombie, in 1801—a landing carried out on an open beach, in broad daylight, in face of a strongly posted and thoroughly



prepared enemy ; in fact, an enterprise which, though finally justified by its success, would appear to err on the side of rashness, rather than on that of prudence.

It is interesting to look for one moment behind the scenes, and see what were the motives which induced Sir Ralph Abercrombie to attempt such a hardy enterprise. We find that his expedition consisted of troops, which for six months past had formed part of a well-equipped expeditionary force, maintained by the Government of the day as a disposable force, at great expense. In the previous year, 1800, an attempt had been made by this force upon the harbour of Ferrol, in which lay six Spanish men-of-war. The expedition silenced the forts and landed the troops on the shore of the bay, who successfully drove back the resistance opposed to them ; but after bivouacking for the night the general in command became alarmed at the apparent strength of the Spanish defences, and the information which reached him as to the preparations of the enemy. He thereupon requested the admiral to re-embark the expedition, which was accordingly done, and it returned to Gibraltar.

Two months later, a somewhat similar attempt was made with twenty-two ships of the line, thirty-seven frigates and sloops, and eighty transports, containing 18,000 troops, on Cadiz.

The expedition demonstrated before the place, and a few troops were actually put on shore ; but hitches occurred, difficulties increased, and finally, frightened, it is said, by reports of a terrible plague said to be raging in the town, the expedition was withdrawn without effecting anything.

It was then decided to undertake the expulsion of the French Forces from Egypt, and it was intended that the expedition under Sir R. Abercrombie should co-operate with another to be brought from India under Sir David Baird, and also by a Turkish Force.

But on arriving at Marmorice Bay, in Asia Minor, it was found that no Turkish co-operation could be reckoned upon, and that there were no signs of the expedition from India.

Sir R. Abercrombie felt that the case was urgent. His orders were positive, and he felt that the character of the British Army, after the preceding two failures, rested on his attempt. He, therefore, in spite of the absence of those who should have co-operated with him ; in spite of the rough and boisterous weather, which caused all the local pilots to declare that it would be madness to attempt a landing till after the equinox ; in spite of his being unprovided with maps of the country, and having only imperfect information as to the numbers of the enemy, he decided that he would carry out the enterprise at once, and alone. The details of this operation are fortunately on record, and as for many years it was considered as a model, they may still be worth examining.

Warned by the experiences of Cadiz, where he had been present, Sir R. Abercrombie utilised his period of detention in Marmorice Bay, in daily practising his troops in embarking and disembarking with rapidity.

The expedition, consisting of about 12,000 men, with their stores, etc., was accommodated in ships, sloops, etc., to a total number of 175



sail. They embarked on February 20th, 1801, but were prevented by the boisterous weather from sailing until the 23rd.

The difficulties which daily beset the expedition were such as would have stopped any but the most resolute commander. In addition to the want of information as to the country, the strength, and dispositions of the enemy he was about to encounter, the boisterous weather split up his flotilla, and many of the smaller ships, containing artillery and cavalry horses, parted company, while one vessel, laden with mules, foundered outright. Two officers of engineers, sent in advance to reconnoitre Aboukir Bay with a view to the landing there, were unfortunately trapped by the French, one being killed and the other taken prisoner; and not only did this misfortune make it very probable that the French had warning of the approach of the expedition, and the contemplated point of landing, but on the morning of March 2nd a frigate was observed to part company with the fleet, and sail into Alexandria. This was found to be a French frigate, which had accidentally, during the night, sailed into the midst of the expedition, and which, by the judgment and address of her commander, had actually spent a long time in company, without attracting any suspicion, and now carried the news of its approach to the enemy. It was now certain that the French were warned, and not only this, but the continuance of boisterous weather from the North caused such a surf on the beach that landing could not be thought of. The ships lay off the shore from the March 3rd to the 7th, when the sea began to go down.

During all this time the French had leisure for preparation; guns were mounted on the sand-hills commanding the beach, and it became known that the landing would be disputed by at least 2,000 French strongly posted with fifteen guns, in addition to the heavy guns in the Castle of Aboukir.

At 2 a.m. on March 8th the 1st Division of the Army, about 5,500 men under Major-General Coote, assembled in the boats, the remainder of the 1st Division, for whom there was no accommodation in the boats, being transferred to small ships of light draught, to be taken as close to shore as possible, so that a support might be quickly given after the first landing was effected.

At 3 a.m. the signal was given for the boats to proceed to a rendezvous near a vessel anchored about gunshot from the shore, but so great was the extent of the anchorage, that the assembly and arrangement of the boats could not be completed till nearly 9 a.m. Each flank of the boats was protected by armed gun-boats, while two bomb vessels were placed to cover the landing with their fire, and three other vessels were moored with their broadsides to the shore with the same intent, but the shallowness of the water prevented any really valuable co-operation from the fleet.

The shores of Aboukir Bay are low with a few sandy elevations, rising to a height of about 180 feet near the centre of the bay, interspersed with date trees.

The troop boats were ranged in three lines. In the first line were large flat-bottomed boats, each holding fifty men, and ordered to keep at

intervals of 50 feet and in line. Behind followed ship's cutters and towed launches. The second and third lines contained men of the same companies as those in the front line, and were ordered to land in the 50-foot intervals between the flat-bottomed boats, which latter were further to have grapnels dropped from their sterns on nearing the beach, so as to warp off, clear, the moment their men had disembarked. The boats were divided into divisions each under a naval captain, who followed the signalled directions of the officer superintending the debarkation.

The following extract from Sir R. Ambercrombie's orders is of interest:

"When ordered to land, the men are to be put into the flat boats as expeditiously as possible, but without hurry or disorder. They are to sit down in the boats, and in rowing to the shore the strictest silence is to be observed. The troops are positively ordered not to load till formed on the beach. The formation to be effected as soon as possible. The men are to fall in in line opposite to where they land, nor is any individual or body of men, in conceiving themselves displaced, to attempt to regain their situation by closing to either flank till ordered to do so by the general officer on whom they depend, or the senior officer present on the spot."

The troops were ordered to land with sixty rounds of ammunition and two spare flints per man. Three days' rations, ready cooked, were to be carried with the troops, and a similar quantity in addition was to be put ashore in kegs under charge of the quartermaster of each regiment. Each man was to carry his canteen filled with water, and so carefully was every detail thought out that commanding officers were reminded that the canteens, which had been out of use for some time, were to be kept filled for some days previous to the landing, to ensure their being in good order. Three days' barley for the horses was also to be landed.

Then follow other and very sound orders regarding the duties of outposts, directing the sending out of patrols, the reconnoitring of their surroundings by officers on picket, and orders in general terms enjoining the most rigid economy in the consumption of fuel and water and the diminishing in all possible ways the labour of the soldiers, whose health the officers are directed to look after with vigilance.

At 9 a.m. on the 8th March, 1801, the signal was given for the boats to advance. The French troops posted on the sand hills forming a concave position with a front of about a mile, could hardly believe at first that such an enterprise was really going to be attempted.

But when the boats got within range they opened upon them a tremendous fire of grape and musketry. Several boats were sunk outright, and the troops, crowded as they were, seated on the bottoms of the boats with their firelocks between their knees, suffered severely. But there was no thought of pausing. The boats continued to advance at speed, the troops cheering, and on reaching the beach they sprang out, and, forming as they advanced, the 23rd and 40th Regiments rushed the heights without firing a shot, but charging and breaking the battalions which opposed them. Space unfortunately does not permit of further detail of this gallant landing, which was, however, entirely successful, but which cost the lives of 650 gallant men.

COMMENTS.—An endeavour has been made to set forth the account of this expedition in true relation to the circumstances of the moment. There is little doubt that, judged by the cold rules of prudence, and apart from the special circumstances of the time, the enterprise was intrepid to rashness; yet, under the circumstances, had Sir R. Abercrombie showed less resolution, or become alarmed at the formidable nature of the French position, it is much to be feared that his prudence, however just, would have involved both himself and the Army in eternal and irretrievable obloquy.

At the same time, the scheme of landing deliberately, in front of a prepared enemy in position, and furnished with artillery and cavalry, is open to the gravest objection. The great uncertainty, in those days of sailing ships, of any co-operation between two forces such as Sir D. Baird's from India, and Sir R. Abercrombie's from Europe, is once more evident, and more will have to be said on this point hereafter when we come to the days of steamers. The policy of practising his troops in disembarkation, while lying idle in Marmorice Bay, bore good fruit at the moment of landing.

The dependence of the ships, furnished only with sail power, upon the winds and weather was absolute, and the difficulty of keeping them together, and of ensuring the simultaneous arrival of the whole at any point, was so great, that feints on points on other than those where the landing was to be carried out, with a view to deceiving the defenders and misleading them into false dispositions, were too risky to be attempted. More will have to be said on this point later. The great desirability of selecting a sheltered spot for disembarkation is also obvious. It should be noted that there was no apprehension of any interference from seawards, the English having command of the Mediterranean.

*Example No. 4.*

TWO INCIDENTS OF THE CHINESE WAR OF 1840-41.

*Authority*—"The Chinese War," Ouchterlony.

The British expedition to China, in 1840, furnishes several instances of combined attacks by ships and troops upon land defences. These are chiefly remarkable as excellent instances of cordial co-operation between the land and sea forces.

The methods were much alike, viz., to land the troops at a distance of some miles from the flank of the Chinese position, the ships then anchoring abreast of the batteries and engaging them with their heavy guns, until the head of the column of troops approached so near the fort that the ship's fire was dangerous to them. The sailors then landed in their boats, and assailed the works in front at the same time as the troops took it in flank.

Detailed descriptions of these landings would take up much space and be of little use, as they were mostly undertaken for more or less local objects.

It appears only necessary to mention one or two points, which happen to be of such a nature as not to necessitate the operations themselves being fully described.

On the 5th July, 1840, a division of troops had been landed by the British near Ting-hae, and the suburbs of that town were occupied. As the indications pointed to a serious resistance being offered by the town itself, and it was getting late, the troops were directed to find the best quarters they could in the suburb for the night, and prepare for action early the next morning.

In their search for billets, the troops came across some stores containing Samshoo spirit, and a large number of them got into a state of helpless intoxication. Happily the Chinese did not seize the opportunity of attacking the force while thus demoralised.

On the 25th of May, 1841, a force had been landed in boats—native decked boats which had been secured by the naval officer, who made the preliminary reconnoissance of the ground where it was proposed to land—and had captured some of the outlying forts of the City of Canton; but the rapid following up of this success was prevented by the failure of ammunition, the amount landed with the troops having been insufficient, and a whole day was lost on this account.

COMMENTS.—The lessons to be drawn from these two incidents are obvious. It is interesting to note that in this expedition we find the first employment of steamers, which were of the greatest use. The co-operation of ships and troops throughout the campaign was excellent.

*Example No. 5.*

THE LANDING OF THE ALLIES IN THE CRIMEA, 1854.

*Authority—Kinglake's "Crimea."*

In the year 1854, it was decided that the allied armies of France, Britain, and Turkey, then operating in Bulgaria, should be transferred to that part of Russia known as the Crimea.

The French embarked 24,000 infantry and seventy guns, with four horses per gun, but no cavalry, mostly in men-of-war. The English embarked 22,000 infantry, with 1,000 cavalry, sixty guns fully horsed, a complete ammunition column with draught animals, and sixty other horsed carts in transports.

The Turks embarked 5,000 to 6,000 infantry in Turkish men-of-war.

The French embarkation was completed two days sooner than the English, as the shipping of the latter's horses was greatly delayed by the swell. The warships of both French and Turks were so encumbered with troops that they could not have been fought had occasion arisen. The English troops were entirely on board transports, and none were in the men-of-war.

To ensure certainty of arrival, it was arranged by both British and French to move their armies either in steamers or in transports towed by the steamers, and the flotilla sailed on September 7th, 1854, and arrived at its point of rendezvous on the 9th.

The coast was reconnoitred, and Lord Raglan, the British General, decided to effect the landing on a strip of beach to the northward of Sebastopol, near Eupatoria.

The place selected was a strip of beach, with a salt water lake just to shorewards of it, and a buoy was to be laid down off the centre of the chosen ground to divide it into two parts. The French and Turks were to land to the south of this buoy and the British to the north, and the ships were arranged as near to the beach as possible.

But an unforeseen incident spoilt these arrangements. During the night of September 13th, the French officers charged with the laying out of this buoy, whether by accident or design, placed it in the wrong place, at the north end of the proposed landing place, instead of the centre as arranged. The result of this was that the French had engrossed the whole of the bay for themselves.

When Lord Raglan saw what had been done, he saw also that the moment was too critical to get into controversy with the French by proposing to move the buoy. He thereupon wisely resolved to make the best of it and to land his forces in the next bay to the northward, and this resolve, though it separated the allies at the moment of landing, was yet better than dispute or confusion, and, though the plans of the British were thus deranged, yet they soon conformed to the new arrangement.

The landing of the allies was, through the supineness of the Russians, allowed to take place unopposed, and thus it does not present the same stirring features as that of the British in Egypt in 1801. The plan of disembarkation was modelled on that, and the transports and boats were so ranged that the relative position of each company while approaching the shore should be that required when formed on the beach.

Although the command of the sea was hardly a matter of doubt, yet, as there was just a possibility of an attack from seawards, during the operation of landing, by any squadron which might suddenly issue from the adjacent harbour of Sebastopol for the purpose, the fleet was divided into an offshore squadron to guard against any attack from seawards, and an inshore squadron which came in as close as possible, to cover the landing.

On September 14th, the landing was commenced at 8.30 a.m., and by evening the French had landed three divisions of infantry and eighteen guns, while the English had landed all their infantry and some guns.

The landing was simultaneous all along the line. The troops on landing fell in, and piled arms upon the beach, and were then marched off. The surrounding hills were occupied, as was the town of Eupatoria, by a separate landing party. The troops were exposed to heavy rain that night, and had no tents.

There was some delay, due to the roughness of the sea on the following day, but by the evening of the 18th all were ashore.

It thus took five September days to land a force of 26,000 infantry and artillery, 1,000 cavalry, and sixty guns, with one reserve of ammunition, and three days' rations. The French took the same time. The small Turkish force were all landed complete with their tents and stores in one day, and were thus more comfortably off than the English or French.

The total force thus landed was 63,000 men with 128 guns, which

would carry by land ammunition sufficient for two battles, and supplies for three days. Beyond these limits their provisions had to be replenished from the ships. The expedition was therefore confined to the coast until transport could be collected from the surrounding country.

COMMENTS.—Here we have an expedition consisting of troops belonging to three nationalities. It has been unfortunately impossible in the space available for these short accounts, to enter into the relations subsisting between the English commander, Lord Raglan, and the French Marshal, St. Arnaud, which, satisfactory on the whole, yet were of sufficient delicacy, owing to the temperament of the marshal, to require great circumspection on the part of the English. The wisdom of Lord Raglan's action, when the buoy, upon the position of which the whole of the landing arrangements depended, was found to be in the wrong place, can only be commended.

The value of steam power in ensuring certainty in the movements of large numbers of ships was already recognised, and the decision to move the whole expedition, either in steamers, or in vessels towed by steamers, marks a new departure in the history of expeditions across seas, henceforth no longer to be utterly dependent upon the caprices of the winds, or liable to be checked at critical moments by contrary winds and calms, as we have seen happen in the case of the expedition to Rochefort.

The crowding up of the French and Turkish men-of-war with troops was entirely wrong in principle, and it should be laid down, that, as a rule, the troops should always be kept in separate transports, and never allowed to be shipped on board the fighting ships, where they are not only useless, but a great hindrance.

It has been already remarked that the strain of fitting out an expedition of this size did not fall upon one nation alone, but was shared between three, or, as the Turkish contingent was small, between two.

The Turkish force, however, probably from its very smallness, was made comfortable in tents immediately after landing, while the English and French were exposed to heavy rain without any camp equipage. Looking to the mischief which may have been done to the health of troops, just disembarked, by exposure of this nature, it appears that, when a landing is contemplated in any but a genial climate, some light camp equipage should accompany the troops and be landed with them.

But the fundamental fault of the arrangements for this expedition was the almost entire want of land transport, and the consequent inability of the force to leave the coast. It is very probable that had this army been really mobile, and prepared to advance soon after landing, that the fall of Sebastopol might have taken place at once. Lord Raglan only had sixty carts with him when he left Varna, and although steps were taken soon after landing to obtain carts and means of transport from the surrounding district; yet that obtained was insufficient in quantity, and wretched in quality.



The landing was carried out on a particularly broad front, each army working independently, and this proved a very successful method.

*Example No. 6.*

THE LANDING OF THE ALLIED FRENCH AND ENGLISH FORCES UNDER  
SIR HOPE GRANT AND GENERAL MONTAUBAN AT PEH TANG,  
CHINA, ON AUGUST 1st, 1860.

*Authorities*—"Narrative of the Chinese War of 1860," Wolseley; "Life of Lord Wolseley," Low.

On Monday, July 30th, 1860, a combined French and English Force, having previously rendezvoused at sea 20 miles south of the Peiko River, stood in for the mouth of the river, with the intention of effecting a landing. The same evening the orders were issued, and arrangements made for landing the following morning; but, unfortunately, it grew so rough during the night that the operation had to be postponed till the following day.

So far as our own forces were concerned, the expedition consisted of about 14,000 of all ranks. They were organised in two divisions, each consisting of six battalions of infantry, two batteries of artillery, one company of engineers, a cavalry brigade of ten squadrons, and one battery, in addition to which there was a mountain battery, about 250 sappers, and a small siege train.

Ample stores of tents, camp equipage, etc., accompanied the force, and several fine steamers had been fitted up as hospitals. The total number of transports was 120, while the Royal Navy force consisted of seventy pennants, counting the gun-boats.

It is stated by Lord Wolseley that "England had never before opened a campaign with such a well-organised, or a more efficient, force."

At about 1 o'clock that day the landing party, consisting of the 2nd Brigade of the 1st Division, with a rocket battery, and one of the Armstrong guns, were towed into the river by the small gun-vessels, each of which towed six troop boats, each containing fifty men. The French flotilla also put off at the same time.

Arrived off the forts inside the mouth of the river, the gun-vessels dropped their anchors, and during the evening the brigade was landed. It was found that the boats could not get near the bank, so the troops had to wade. The supposed bank reached proved to be only a large mud flat, over which the men had to trudge up to their knees for nearly a mile before hard mud was gained, and then between them and the causeway lay a broad and deep mud ditch nearly 200 yards in width. The brigade bivouacked on the mud flat and the causeway, very wet and without fires. The chief hardship, however, was the entire want of water, of which not a drop fit for drinking was procurable; and though the men had landed with their water bottles full, yet this amount was utterly insufficient.

The following morning the town, which was found to be ungarrisoned, was occupied. The English troops were kept employed repairing roads, making wharves, carrying water, and landing stores, while the French were idle.



The English landed with three days' provisions, but the French with six. The latter proved too much, as they went bad and were thrown away, and the French troops were thus reduced to living for several days on what they could pick up. Want of water was a great difficulty; the supply in the town was soon exhausted, and boats had to be sent daily up the river to fetch it, and a regular ration of 1 gallon per man was issued.

The town was equally divided between the English and French, the main street forming the line of demarcation. The streets were improved, wooden piers and wharves were erected, and troops, transport animals, and stores, were steadily and rapidly landed. This was greatly due to the English gun-boats, which, aided by steam power, and only drawing 6 feet of water, proved invaluable.

The French had only three or four gun-boats, and those drawing a great deal of water. They consequently took a long time to land even their small force, without any cavalry. Latterly the English lent them two gun-boats.

The Coolie Corps of 2,500 were of the greatest service. They did a great deal of work, were easily fed, and, when properly treated, most manageable.

The weather was unfavourable, and the French were so behindhand in the landing of their stores, owing to want of gun-boats, etc., that no move forward could be made before August 12th, on which date the advance, ending in the successful occupation of Pekin, was commenced.

COMMENTS.—This landing is one of considerable interest, as in many of its details we can trace the experiences which bore fruit in the Egyptian campaign of 1882, hereafter to be related. Perhaps the chief points worth noting are the organisation of the force into two divisions and a cavalry brigade, and the completeness of its outfit; the delay in landing caused by the rough sea; the very unsatisfactory position chosen for the landing, owing to the absence of preliminary reconnaissance, of which fault we shall find other examples; the want of water, so frequent on the sea coast, and of which other instances have occurred, both at Aboukir and Ashanti; and the great use of a good supply of small steam craft for landing purposes.

### SECTION III.—EXAMPLES FROM THE PAST (*continued*).

#### *Example No. 7.*

#### A SURPRISE LANDING IN THE ASHANTI WAR IN 1873.

*Authorities*—Brackenbury's "History of the Ashanti War"; Ellis' "History of the Gold Coast." See sketch, Plate No. II.

Hitherto we have dealt only with operations whose secrecy, so far as it existed, depended chiefly upon the reticence of those to whom the knowledge of the design was confided. Further, in the cases quoted, the means of spreading news were defective; and, except for such unfortunate incidents as we have seen befel both Sir J. Mordaunt and Sir R. Abercrombie, the point where an oversea expedition might be expected to disembark, and the probable date of its arrival, could only be guessed at, until the arrival of the ships.

But the following minor operation, selected as embodying several points of interest, affords also an example of the use of that great weapon of all commanders, viz., the dissemination of false intelligence.

While off Cape Coast in October, 1873, Sir Garnet Wolseley decided that it was necessary to attack and destroy three villages known as Essamen, Amquana, and Ampence, situated to the westward of the town of Elmina, which itself lies to the westward of Cape Coast Castle.

The enemy, however, were known to be in great force at Mampon, close by, while Sir Garnet Wolseley's forces were so weak—only 500 men with one 7-pounder gun and one rocket-trough—that success could not be ensured if the designed attack should come to the knowledge of the enemy. As it was well known that everything known in Cape Coast Castle or Elmina reach the enemy within a few hours, it was vitally important to keep the planned operation an absolute secret.

It happened, fortunately, that a force under Captain Glover was operating near Addah, to the eastwards of Cape Coast Castle, and advantage was taken of this to spread abroad in Cape Coast false reports as to an alleged reverse, said to have been sustained by this officer, and Sir Garnet's intention to move a force eastwards to his aid. Even many officers of the staff were deceived.

On 13th October, 1873, at 6 p.m., the detachment of the 2nd West India Regiment, stationed at Cape Coast, was embarked, expecting to sail eastwards to Accra and Addah. They were, however, taken to the westward, and at 3 a.m. were disembarked into boats near Elmina.

"There was, however, great delay in landing the troops. Four paddle-box boats were towed in by one steam launch. There was only one officer to superintend the whole, and, quick and active as he was, much difficulty was experienced. He did not know the landing. High tide had been expected; it was almost low water. The result was that we all grounded on the bar, got wet through by the heavy rollers, and were nearly swamped."<sup>1</sup>

Some boats took one hour and fifty minutes between the ships and the landing place; thus the march was much delayed, and instead of the departure taking place at 4 a.m., as had been ordered, even the advanced guard could not move off till 4.30, and the main body not until 5.15.

The march was partly along the coast, and although every man had started with his water bottle full, and a few breakers of water were carried by native Kroomen, yet the supply was insufficient. The only water met with on the march was in swampy ground in shallow pools, and quite unfit for drinking. The men were prevented from drinking it, and many were six hours without water. Fortunately, a supply of water was sent ashore by the ships at a point higher up the coast, and this proved a great and unlooked-for relief.

This expedition was entirely successful, the enemy being taken completely by surprise.

COMMENTS.—Although a comparatively minor operation, this affords a useful example. Not only is the use of false intelligence well brought

<sup>1</sup> Brackenbury's "Ashanti War."

out, but the necessity of previous reconnoissance of the point of landing—probably impossible under the very special circumstances of the case—is very clearly shown. The necessity of an adequate water supply is again illustrated. The sea beach and the ground immediately inland is, as a rule, a bad place to find fresh water, while the exertions attendant upon the landing and subsequent operations, are such as to render the provision of plenty of fresh water a most necessary precaution.

No horses were taken with this small force, but the staff officers found that the performance of staff duties on foot was most difficult and fatiguing. It would appear very desirable to land, if possible, the few horses required for staff officers as early as possible, the forage for a few days being landed at the same time.

*Example No. 8.*

THE CHILIAN LANDING AT PISAGUA IN 1879.

*Authority*—"United States Naval Intelligence."

In the years 1879 and 1880, war was in progress between the countries of Chili and Peru, the latter being in alliance with the neighbouring country of Bolivia.

The geographical situation of these countries, on the narrow western watershed of the Andes is peculiar. The difficulty of communication by land, up and down the coast, is very great, the physical features of the country consisting of numerous fertile valleys divided by high ground and deserts, and its immense extent from north to south, rendering such extremely difficult; while, on the other hand, the splendid and extensive sea-board of each country—with an easy and regular coast, with few reefs, no bars to the rivers, large and safe harbours and regular winds—makes sea communication quick and easy; so much so, that the best communication from valley to valley is by the sea. Here then we find splendid opportunities for expeditions of the nature now under consideration. In addition to the above, the constant fine weather allows of much more freedom of operation by sea, and of much more crowding of men into transports, than would be admissible in our stormy seas.

The first necessity before attempting to convey an expedition of troops across the sea is, as has already been pointed out, to obtain the command of it.

In the war now under consideration, the preliminary naval operations resulted in the establishment of the Chilean supremacy by sea, and the capture of the Peruvian "Huascar," and preparations were immediately made by the Chileans to make themselves masters of the rich nitrate province of Tarapaca.

Sailing vessels, to be towed by steamers, were chartered and taken to Antofagasta. Pack animals were bought, the steam transports were supplied with large flat lighters for landing, the large vessels carrying four, secured bottom outwards to their sides, the smaller ones one or two.

The preparations completed, an expedition of Chilean men-of-war and ten or twelve transports of all sizes and descriptions, carrying an army

of 7,000 men, started north from Antofagasta and reached Pisagua in the morning of November 2nd, 1879.

The town of Pisagua is situated at the foot of an almost perpendicular bluff, 1,200 feet high, and defended by a fort on the top, which contained a garrison and large quantities of stores.

It was intended by the Chilians to make a feint of landing at Pisagua sufficient to engross the attention of the garrison, while their main body was to land at Jamnia, some miles down the coast, and, outflanking the bluffs, to attack the fort from the rear.

But events turned out otherwise. A party of 700 men attempting a landing at the northern end of the town, were driven back, but soon after a similar force succeeded in landing at the southern end of the line; and now followed a splendid piece of dash and gallantry, though perhaps hardly in accordance with discipline. For, as the troops sprang on shore, the sailors abandoned the boats to the mercy of the surf and joined them. The town at the bottom of the bluffs was carried at once, and the Chilean force pushed on up the bluffs, the ships assisting by shelling the works just ahead of the stormers. In two hours the place with all its stores was in Chilean hands. The main body from Jamnia, though their landing had been expeditious, arrived too late to take any part in the fight. The landing was greatly facilitated by the large flat scows, which accommodated 100 men each.

COMMENTS.—The expedition was uninterrupted, as the Chilians held the command of the sea. Their preparations were good, and they had evidently recognised the advantages afforded by the large flat-bottomed scows for rapidly transporting their troops between the ships and the shore. As an evidence of the expeditiousness of this means of landing, it may be mentioned that a regiment of 1,200 men with all their material was landed at Coquimbo, and 600 men embarked in their place on board the "Itata" in a little less than two hours.

Whilst recognising the gallantry of the attack, the want of discipline which it evidenced might have led to disaster, as the carefully thought-out scheme of the double landing was entirely set aside. As it was, the loss of life was, as might have been expected, very severe, the stormers losing half their numbers. The co-operation afforded to the troops by the ships when the latter realised what was taking place was prompt and complete.

*Example No. 9.*

THE CHILIAN LANDING AT PACOCHA IN 1880.

In the early part of the following year, the Chilians embarked 12,000 men in twenty transports at Pisagua, and landed 9,000 infantry and 600 cavalry at Pacocha, while at the same time 3,000 men were landed at Vitor, twenty miles to the South of Pacocha.

The landings took place on 25th February, 1880, without opposition, and immediately the transports were despatched to the South for provisions and stores with which to attempt a severe march across the waterless desert which lay before them.

COMMENTS.—This comparatively uninteresting incident is merely given to show the advantages given by steam, large vessels, and modern appliances over those available in 1801. Here we see an expedition of about the same strength as that of Sir R. Abercrombie entirely accommodated in twenty transports, independent of the direction of wind, and capable of being transferred at will to any point of the coast. Provided with its large flat scows and steam launches for towing, the landing could be effected rapidly and easily, while the ships, free with their steam power, could be at once despatched for further stores.

The Chilian practice of landing at two points on the coast is again instanced.

*Example Nos. 10 and 11.*

THE FRENCH LANDINGS IN TUNIS IN 1881.

*Authority*—"United States Naval Intelligence," 1885.

Few of the continental nations have any real experience of expeditions of this nature, and perhaps the following words, translated from *L'Année Maritime*, 1880-81, form as fitting a commencement to the short account of these operations as it is possible to write:—

"The Tunisian expedition has furnished a new proof of the mutual dependence of the Army and Navy.

"The Chilo-Peruvian war has already shown the preponderant part which the Navy may be called upon to play in general strategy. The Tunisian expedition possesses a still greater interest as regards the conduct of combined operations of a Fleet and an Army."

The French Navy was charged with the duties of (1) the transport of the troops and their baggage; (2) ensuring the revictualling of the expedition; and (3) effecting and protecting with its own resources the landing of the troops on the coast of Tunis.

Again, to quote *L'Année Maritime*:—

"This operation of landing the troops was the most delicate and troublesome part of the Navy's duty. The Tunisian expedition, if it had served no other purpose than to draw attention to the importance of preliminary knowledge of the characteristics of the coast, where a landing is to be made, as well as of the possession of a proper equipment of lighters, boats, and floating stages, would have been of immense benefit to our sailors."

Once the expedition to Tunis was decided upon, prompt action was necessary. Steamers were obtained partly by requisitioning the Compagnie Transatlantique and partly from the Port of Toulon. The company professed to be ready within four hours of receiving the notice, but the necessary overhauling of the ships took five days.

The expeditionary force consisted of five brigades, two of which were to operate by the Valley of Majorda, while three acted from Turbakah Island as landing place and base.

*Example No. 10.*

THE FRENCH LANDING AT TURBAKAH, TUNIS, APRIL 26TH, 1881.

On 15th April, 1881, the gun-boat "Hyene" was sent to reconnoitre the shores of Turbakah.

The orders given to the officer in command were to confine himself to reconnoissance and avoid action, unless it were forced upon him; to try and communicate with the inhabitants and gather information about the disposition of the native population, and also of the Tunis garrison; to examine, from a military point of view, the island, its approaches, the houses and especially the fort on the coast of the mainland, its ranges, its sides where it could be attacked from the sea, those by which its approaches could be defended, and also the best point to land a body of men. Also to determine the elevation necessary for the guns of the fleet to reach the fort, and to see that the charts showed correct soundings—not to interfere with vessels landing warlike stores unless they were French, in which case to seize them.

The reconnoissance was effected with no further incident than a boat's crew being fired upon while taking soundings, which, in accordance with above instructions, was taken no notice of. The result of the reconnoissance was a report to the effect that with a ship armed with heavy guns to silence the fort and a smaller vessel to make the passage across from the mainland impracticable, and to prevent re-inforcements from the mainland reaching the island, the landing of troops and the occupation of the island would be easy, and the island once occupied there would be no difficulty in taking the fort on the mainland. It was recommended that the force should be in position by day-break, and that the fort should be taken.

On the 17th April, at 9 p.m., the "Surveillante" left Bona Harbour with three gun-boats conveying 500 infantry, some artillery and engineers, with provisions, horses, mules, and material complete.

The expedition arrived on April 22nd, and the landing was fixed for the 24th, but the unfavourable state of the sea, which made landing perilous, necessitated a delay till the 26th.

The following were the measures taken by the French, in anticipation of resistance being offered by the governor of the fort:—

A point was selected for the landing, sheltered, accessible, and of sufficient extent to permit of the landing of all the boats at once. This spot was covered on its left by a river whose passage was commanded by gun-boats with troops on board. The surrounding ground could be kept clear of the enemy by the French artillery. The troops could, therefore, land without serious molestation, provided the eastern part of the fort could be silenced, and for this purpose it was determined to bombard it before attempting the landing.

The ships were, therefore, placed in situations convenient for the bombardment, and so as not to interfere with one another's fire. Arrangements were also made in detail for the landing to be carried out after the bombardment. On the 25th April the swell had gone down, and a landing appeared practicable. The fort was summoned to surrender, and fire was opened at 4 p.m., but there was no reply. The eastern face of the fort was, however, demolished to make sure. The gun-boats fired upon the island, which was abandoned by its garrison. On the morning of the 26th there was too much swell to attempt

a landing on the mainland, but the island was occupied without resistance ; but in the afternoon the beach of the landing place was cleared by the ship's fire, and the landing was accomplished with great rapidity, the whole force, with its guns, provisions, baggage, reserves, and mules, being landed between 2 and 5.30 p.m.

As soon as sufficient men were ashore, the heights which commanded the beach were occupied, while another party took possession of the fort, the Arabs being driven off by the sharpshooters, assisted by the machine-guns of the ships.

At 4.30 the following morning the landing of the stores was proceeded with, but by 10.30 the beach was impracticable, and the landing was suspended; no boats could reach the shore throughout the 28th, and only a few boat-loads of stores were got ashore during the 29th.

It being finally decided that Turbakah was not good enough, as a base of operations, the splendid port of Bizerta was occupied without resistance, on May 3rd.

COMMENTS.—Although this was a small expedition, and turned out to be practically an unopposed landing, yet it appears worthy of being quoted, as showing the thoroughness and good arrangement of our neighbours.

The comprehensive orders to the reconnoitring ships might almost serve as a model, while all the arrangements for the landing were well thought out.

The desirability of always, if it be possible, selecting a landing place sheltered from the surf, is well illustrated by this example. Not only was the actual landing prevented for two days after the date intended, but hardly were the troops on shore when further interruption to communication was caused by the weather. It is needless to point out how very serious, or even fatal, such delays and interruptions might prove, in the face of an active enemy, bent on opposing the landing, or in driving the landing party back into the sea.

The operation in this case being practically against savages, no question as to the command of the sea arises.

*Example No. 11.*

THE FRENCH LANDING AT SFAX, TUNIS, 16TH JULY, 1881.

See sketch map, Plate No. 11.

We now come to an operation on a larger scale than the preceding, and carried out, as in the last instance with much forethought, gallantry, and dash.

The town of Sfax was surrounded by a high wall, besides which the Arabs had thrown up some advanced works well armed.

The most peculiar point in connection with the shore at this place was the exceeding shallowness of the water near the shore, the steam launches and larger boats not being able to approach the beach nearer than 300 to 400 metres. The smallest cutters were only able to reach



the beach at high tide, while the bottom consisted of mud so soft and so deep, that the men were unable to wade ashore.

Prior to the arrival of the expedition, partial bombardments of the defences by gun-boats and steam launches, with guns mounted in them, took place on July 5th, 6th, and 7th, and a larger bombardment on the 8th, but with little result worth mentioning.

The squadron of ironclads arrived on the 14th, and anchored according to their draught of water, at about 6,500 metres, and were to bombard the city with a slow fire from their heavy pivot guns, while the gun-boats, which could get in to 2,200 metres, were to demolish the beach defences, and breach the high city wall.

The following is the synopsis of the arrangements:—

On the morning fixed for the landing, a violent bombardment was to begin at daylight, the signal being a gun from the flag-ship between 4.30 and 5 a.m.

All the boats loaded with men were to be ranged as near to the beach as possible before 6 a.m., and a flag signal from one of the nearest gun-boats, to be repeated by all the vessels, was to indicate the moment to dash in and land.

The boats of the fleet, together with the native boats available, gave room for the landing of 3,000 men at once. It was arranged to land 1,500 sailors, and 1,500 soldiers, the remaining troops to be landed as soon as the boats could return to fetch them.

The admiral himself personally superintended the order, rapidity, and security of the landing, so that, once ashore, the troops could be marched to the points where they were to operate.

As the water shoaled so gradually, there was only one point where the boats could approach the beach, and this point was exposed to the fire of the town batteries.

The admiral had ordered a floating landing stage to be constructed of topsail yards. Each of the six iron-clads of the squadron was ordered to construct a raft. All these rafts were to be towed during the night as near to the beach as possible, by the steam launch belonging to each vessel. A naval captain was detailed to superintend the lashing of these several rafts together, to form a landing stage, which was to be towed ashore by the boats as far as they could take it, after which it was to be poled or warped in.

The pulling-boats of three ships armed and equipped, and two sheet-iron barges (*canot lambours*) each carrying a large howitzer, were directed to be between 4.30 and 5 a.m. as near to the beach as possible, and to aid the gun-boats by their fire in sweeping the shore to protect the troop-boat flotilla.

This armed squadron consisted of eighteen boats, carrying four 12-c.m. shell guns, one 4-c.m. gun, and thirteen revolving cannon, and two sheet-iron lighters belonging to the transports, one with 14-c.m. and one with a 16-c.m. gun. These lighters did great service, in spite of their clumsiness and unwieldiness.

Each ironclad was to provide a certain number of torpedoists, furnished with explosives and sand-bags.

Communications were to be kept up all through, from the extreme left to the extreme right.

The men carried one day's provisions and ninety-six rounds of ammunition per man. Artillery, thirty-six rounds per gun. A reserve of provisions and ammunition was also formed.

The orders to the officer commanding the armed squadron were :—

- (1)—To approach by daylight as near as possible.
- (2)—To sweep the beach by artillery and musketry fire.
- (3)—To suppress the fire from the water battery and ramparts.
- (4)—If the result of the landing were unfavourable, to protect the re-embarkation.

The first landing party was divided into three battalions, and to each a definite duty was assigned.

Two battalions were to land at the same place, but one was to have precedence of the other, while the third was to land at a point about 300 metres further down the coast.

By 4.30 a.m. the landing-stage was ready, and the boats of the armed squadron were massed in order, 500 metres from the water battery, exposed to a poorly-aimed fire from the enemy. On the signal being made to land, there was a rush made by the troop-boats to the shore. The battalion which had been intended to land second, being in ship's boats, while the other was in native boats, succeeded in getting in front of the latter, while the third battalion, instead of landing at the spot assigned, feared that they might ground in shallow water, so landed at the same place as the other two. The ardour of the men, the limited space available, and the unforeseen change in the order of landing, caused some confusion.

Meantime, the Arab trenches—which were masked by bundles of hay and grass—were well swept by fire from the ships, and, the grass being set on fire in many places, and the wind setting the smoke into the trenches, they became untenable.

At the same time, the fire of the armed boats prevented any reinforcements coming from outside. The armed boats and flat lighters fired into the water battery and south trench, moving so as to enfilade them, and their shells caused much confusion among the enemy, and assisted much in the taking of the battery; they then supported the advance. The fire from the ships themselves ceased as soon as the troops touched the beach. The water battery and south trench were rushed by the troops nearest to them. There was no breach in the high walls of the town, but the boat guns, aided by some of the torpedoists, blew in the gates, and the town was shortly afterwards in the hands of the French.

Towards 3 p.m., everything being secure, and all posts occupied with French troops, the entire brigade re-assembled on the beach, the men in a very exhausted condition. It was intended to issue a ration of bread

and wine, but this was found impossible, the steam launches containing the provisions being occupied in towing.

COMMENTS.—This, a much larger operation than the preceding one, again bears testimony to the forethought, skill, and dash of our neighbours across the Channel. The nature of the shore was ill adapted for the landing of a large body of men; but, by the excellent arrangements, it was satisfactorily accomplished in the face of the enemy.

The construction of the floating landing stage was an interesting experiment, and it is stated to have answered well, and that nearly all the troops landed dryshod, in spite of the very gentle slope of the shore. The stage consisted of six rafts, which had been left with the gun-boats the evening before, and these rafts were lashed together end to end. Whale-boats were lashed alongside of each raft, and formed a part of it, and the whole structure, towed in as near as possible by a launch, was finally warped in by means of an anchor laid out on the beach, being kept perpendicular to the shore by means of another anchor at its seaward end.

The confusion caused by the landing party not adhering strictly to their orders might, in the face of a determined enemy, have been fatal to the whole success of the operation; and this strongly brings out the wisdom of Sir R. Abercrombie's strict order, issued eighty years previously, already quoted, that no troops conceiving themselves displaced were to attempt to move to a flank, or take up a different position, without definite orders so to do. No provisions appear to have been landed, other than what the men had in their haversacks. It would have been better to have landed the bread and wine which were on the launches, and left them on the beach, under a quartermaster, so that they would be available for the troops at any moment.

#### *Example No. 12.*

##### THE BRITISH LANDING IN EGYPT IN 1882.

*Authorities*—"Military History of the Campaign in Egypt," Col. Maurice, R.A.; "United States Naval Intelligence." See sketch map, Plate III.

We now come to an expedition which is likely, for a long time to come, to serve as a model. From whatever side it be considered—strategical, administrative, or tactical, or as an example of excellent co-operation between the sister services—it is seen to be an immense advance on anything which has preceded it. The more the subject of the conduct of an expedition across the seas is considered, and the more the details of this example are investigated and compared with those of former expeditions, the more clearly does it appear with what a correct appreciation of the situation its general plan was conceived, how carefully thought out were all its multitudinous details, with what ability the resources of the country in shipping and transport were utilised, and how thoroughly the history of previous operations must have been considered, their lessons noted, and their mistakes avoided.

In fact, when studying the arrangements and execution of this expedition, it is impossible not to feel that one is merely following in the

track of those who have already, as the Americans say, "been there"; that the lessons which it has been attempted to draw from the operations of the past, have been previously thought out, and received their full weight in the present instance, and that little that is new can remain.

The value, however, of this example is very great, as it affords a splendid instance of the application of the lessons of the past to modern conditions, and it would be quite impossible to deal completely with the subject of landings without referring somewhat fully to this expedition.

In this case the political causes that led up to the expedition have little bearing on its details, and need merely be glanced at. It is enough to say that the country was practically in the hands of Arabi Pasha and his friends, with 50,000 to 60,000 troops at their backs, religious fanaticism ran high, the country had become unsafe for foreigners, and British interests—both in the maintenance of a responsible Government, and in the keeping open of the Suez Canal route to India—became so imperilled, that intervention had to be resorted to.

Geographically, Cairo at the head of the Delta, which was in the hands of Arabi, became the objective point. To approach it by way of the Delta, intersected as is the latter by innumerable canals, and entirely without roads—the whole of the traffic being either water-borne or effected by railway—would, in the face of determined opposition, have been a most difficult task. On the other hand, the canal itself gave convenient access to the smooth sheet of water, Lake Timsah, where a perfectly secure landing, without liability to interruption by surf, could be relied upon; while the country between Ismailia and Cairo was clear and open desert, healthy, and free from obstacles, and a railway line and canal of fresh water existing along the proposed route. Moreover, the distance from Ismailia to Cairo was only 96 miles as against 127 from Alexandria, and Ismailia was, therefore, decided upon as the point where the landing was to be effected. As the canal could be blocked and rendered useless with the greatest ease, it was of vital importance that no hint of the real plan of operations should be breathed. Instructions were issued to the troops holding Alexandria, which had been previously bombarded and occupied, to keep Arabi employed by showing as much activity as possible. A contingent of nearly 7,000 fighting men was ordered from India to Suez, to co-operate with the forces from England. It was laid down by General Lord Wolseley that, to ensure the mobility of the force on landing, every regiment of cavalry, battalion of infantry, battery of artillery, and company of engineers, should embark, complete with its regimental transport and tentage. To be certain of being able to make use of the railway between Ismailia and Cairo, arrangements were also made for the taking of five locomotives, and rolling-stock sufficient for four trains.

The expeditionary force consisted of an Army Corps of two Divisions and a body of Corps Troops.

Each division was complete in itself, and so organised as to be able to act independently if required. Each consisted of two infantry brigades—each of four battalions—besides the divisional troops, con-

sisting of one extra battalion of infantry, two field batteries, two squadrons of cavalry, one company engineers, with commissariat and transport company, half a bearer company, a field hospital, post office, and veterinary department.

In addition to the two divisions constituted as above, there were the corps troops, under the direct orders of the Commander-in-Chief. They consisted of: (1), the Cavalry Brigade, complete in itself, consisting of three regiments of cavalry, with one battery of horse artillery, commissariat and transport company, and half a bearer company, post office, etc.; (2), the Corps Artillery, one horse and two field batteries with an ammunition column, and the siege train comprising four batteries of garrison artillery; and (3), the Corps Engineers with pontoon troop, telegraph troop, field park, and railway staff. In addition were the ordnance store department, commissariat and transport corps, four field hospitals, the military police, the veterinary department, half a bearer company, and the post office.

In addition there were two battalions of marines serving as infantry.

In round figures the numbers of the various arms transported to Egypt was as follows:—

Infantry	..	..	15,600	(including marines)
Cavalry	..	..	2,300	
Artillery	..	..	2,450	(including siege train)
Engineers	..	..	1,150	
Commissariat and Transport			1,300	
Medical, etc...	..	..	750	

The Indian Contingent has not been included in the above statement, coming as it did from India, and under necessarily different arrangements as regarded its transport, etc. (e.g., a native cavalry regiment, with its followers and transport, required about six ships, and a native infantry battalion two ships). It must almost be considered as quite a separate expedition. It may be mentioned here that it consisted of nearly 7,000 troops, with their transport, horses, and camp followers.

This force also had a reserve dépôt established at Aden.

Depôts were formed at Malta and Cyprus, and two additional battalions of infantry and one battery of artillery were sent for garrison duty at Alexandria.

Each unit embarked on board its own ship, with its transport and tentage complete. To each infantry battalion was allotted one ship, each of which carried, on the average, about thirty officers and 760 men, with fifty-five horses, two water-carts, ten two-wheeled carts, and about 150 tents of sorts. The cavalry had two ships per regiment, each of which carried, on the average, thirteen officers, 290 men, and 270 horses, with water-cart and three two-wheeled carts, while a proportion of small-arm ammunition carts and forge wagons were taken; from sixty to seventy tents were also taken in each ship.

The artillery had one ship per battery, averaging seven-officers, 170 men, and 130 to 180 horses, with about forty tents, and, of course, their guns, ammunition, and stores. The ammunition column had one ship,

carrying 185 officers and men, and 207 horses, with the ammunition reserve. The engineers were similarly provided for in separate ships, as also were the base hospitals and other departments.

Including store ships, etc., nearly seventy large steamers were required for the expedition.

These were allotted as follow :—

<i>Troops.</i>	<i>Ships.</i>
Cavalry .. .. .	8
Artillery .. .. .	10
Infantry .. .. .	10
Engineers .. .. .	5
Ordnance Store Department .. .. .	3
Commissariat and Transport .. .. .	19
Hospital Ships .. .. .	2
Miscellaneous .. .. .	11

Every transport that came out from England brought horse-boats or flats to assist in disembarking their horses.

The above detail will give some idea of the magnitude of the task to be accomplished. In addition, no less than nine powerful tugs were provided and sent to Ismailia.

The despatch of the expedition from England was effected with great celerity. Between July 30th and August 12th no less than forty-one large transports were despatched to the seat of war; advantage was taken of our numerous excellent ports, so that the despatch of troops and stores was going on from several ports at the same moment, and yet without the least interference one with another. Of the forty-one vessels above mentioned, thirteen sailed from the port of London, eleven from Southampton, nine from Portsmouth, two from Liverpool, three from Kingstown, one from Queenstown, and one from Woolwich.

As an example of the ease with which an expedition can be despatched by this decentralisation, on the 4th August, ships sailed from London, Southampton, Liverpool, and Portsmouth simultaneously.

And while the arrangements for sending off this expedition were in progress, equally thorough arrangements were being made for its disembarkation at the greatest speed possible. Under our present arrangements the Royal Navy have the responsibility of landing the troops, with their horses and stores, on the beach when the transports reach their destination. To one officer is given the entire local control over the transports.

The officer to whom this responsible duty was entrusted made most excellent arrangements, and his plans were matured before leaving England. He persuaded the Admiralty to assign to him the old trooper "Thalia" as a disembarkation office, with a specially large crew of 430 men, particularly strong in mechanics. She was also supplied with plenty of boats, both steam and pulling, and an electric light.

As above remarked, the transports brought their own horse-boats and flats, the latter being decked lighters; the "pontoon" rafts carried by the Indian troop-ships, and so familiar to all who have travelled by these



vessels, were also utilised in Lake Timsah, and proved of great use, as they were capable of carrying thirty-five horses at a trip; the lighters were managed by working parties from the "Thalia."

With the above sketch of the chief arrangements for the expedition, some knowledge of which is essential for a due appreciation of the causes of its success, it is now time to turn to the expedition itself, which duly assembled off Alexandria, without mishap, and with the certainty and precision which is ensured by the steamships of the present day. The greater number of the transports accomplished the passage in twelve days or less.

The condition of affairs at this moment was as follows:—In the first place the Canal was still open, and ships were passing through as usual. M. de Lesseps, who resided at Ismailia, had persuaded Arabi that the British would never dare to interfere with the Canal, and to this fortunate delusion we probably owe the fact that the Canal was not blocked by Arabi sinking a few dredgers or other craft in it—an event which would have spoilt many of the British plans and possibly have necessitated a landing at some other point, involving much greater difficulties both in the actual disembarkation and the subsequent proceedings. Arabi held the whole country of Egypt with the exception of the two points of Alexandria and Suez, at both of which British forces were ashore. The British had a naval force afloat at Port Said, and some small craft at Ismailia, while the towns of Port Said and Ismailia were occupied by Egyptian troops in the interest of Arabi.

THE LANDINGS ON THE BANKS OF THE SUEZ CANAL, AUGUST 18th,  
1882.

During the assembly of the expedition, not a hint was breathed as to the Canal; but, on the contrary, everything pointed to an advance up the Delta from Alexandria. When assembled, orders were issued for a general landing in Aboukir Bay, the scene of Abercrombie's exploit, and for an advance from that place. Detailed orders for the operation were issued, and on August 18th, at 3.30 p.m., the whole flotilla anchored in regular lines in Aboukir Bay.

After darkness had set in, however, the fleet moved eastwards, and arrived off Port Said the following morning, by which time the whole of the Canal was in the hands of the British Navy. For, during the night of August 18th, a force of seamen were landed in the town of Port Said, completely surprising Arabi's garrison; another force effected the surprise and occupation of Ismailia; while a third force passed along the Canal, occupying every dredger and "gare," and seizing the telegraph office at Kantara.

These preliminary landings at both Port Said and Ismailia deserve to be recorded as examples of most delicate operations, carried out with entire success. In the case of Port Said it was most desirable not to arouse the suspicions of the French naval force, one of whose ships, "La Galissonnière," was actually moored to the same buoy as the "Monarch," from which ship the landing was to be effected. The only preliminary



preparation was the temporary decking over of a lighter, ostensibly for some other purpose, which, after dark, was placed alongside the ship. The crew had no idea of the contemplated landing. Not till 11 p.m. were the men warned that they would be required to land at 3 a.m.

The town being well known, the landing party was divided into sections, and the exact route and objective of each section was laid down beforehand. The men were to have cocoa before landing, and breakfasts were to be sent ashore at 7 a.m. They were not to land with loaded rifles, nor to load without orders; strict dress and parade arrangements were insisted upon, and discipline was to be fully maintained.

A few minutes before the appointed time for the landing, the decked lighter was quietly hauled to the shore, and, with the ship's launch, formed a floating bridge, over which the landing party passed so silently that nothing was known of the matter by the French ship only a few yards away.

With such arrangements success followed as a matter of course.

At Ismailia, where Arabi's garrison was of considerable strength, great care was necessary. Here also at 3 a.m., in perfect silence, and utterly unexpectedly, 565 men were landed, and the guard surrounded. Completely surprised, the resistance was of the smallest, and by 4 a.m. the whole place was in British hands. The Navy immediately assumed the protection of the Canal, patrolling it constantly, and the "gares" of the northern half were occupied by strong detachments with gatling guns, protected by breastworks.

This was the state of affairs when the British transport fleet arrived at Port Said. Only one drawback to the immediate use of the Canal existed in the shape of a French Messagerie steamer, coming northwards through the Canal, which refused to tie up to allow the transports to pass; and as it was undesirable to use compulsion, she was permitted to proceed, thus blocking the Canal for several hours. It being, however, desirable to support the force at Ismailia with troops without a moment's delay, 600 infantry were put on board two small craft which could pass the Messagerie steamer, and arrived at Ismailia the same evening.

As troops from Cairo were seen to be arriving by rail at Nefiche Station, which was within long-range fire from the ships, the latter, by a most skilful artillery fire, succeeded in destroying the Egyptian camp, driving the enemy away, and wrecking a train, which blocked the line, and cut off Arabi from railway communication with his troops beyond Nefiche.

When the Canal was clear, the British vessels entered it, arranged so that the troops they were conveying were in the following order:—First came 500 marines with some lighters, then the disembarkation ship "Thalia," already referred to, conveying more lighters and working parties; then came the remainder of the two battalions of marines, with forage, coal, and railway staff, and some engineers; then two brigades of infantry complete with their staffs, the commissariat, mounted infantry, a half bearer company, and two field hospitals; then the cavalry brigade, with

one battery horse artillery and one field battery, and finally more lighters and railway plant.

This advanced guard, with certain delays due to vessels grounding, reached Ismailia, and there disembarked. There being quite insufficient wharf space, nearly all the troops had to be landed in lighters and tugs. The infantry were landed with great rapidity, two regiments complete, with their baggage, being put ashore in two hours, and the Highland Brigade—between 3,000 and 4,000 strong, but without baggage—were landed in three hours. The cavalry and artillery, as usual, took longer to land than the infantry.

With the subsequent operations, ending in the complete success of the expedition, the overthrow of Arabi, and the occupation of Cairo, we are all familiar.

• COMMENTS.—This expedition has been described with some fulness of detail, as it presents an excellent example of good organisation and arrangement, while the mistakes of former expeditions appear to have all been avoided. The want of mobility from which the allied forces in the Crimea suffered after being put ashore, owing to the absence of transport, was guarded against by the wise arrangement that every unit was to embark with its own transport and tentage complete. The selection of the smooth waters of an inland lake for the landing place of the force showed a correct appreciation of the difficulties and dangers of a landing on an open coast. The strategic design of landing upon Arabi's flank, where yet there existed the priceless advantage of a railway and canal of fresh water, was excellently conceived; but it never could have been carried out without interruption had not the strictest secrecy been maintained, and aided by the ruse—which we have seen previously employed in the Ashanti expedition—of announcing an objective point quite other than the real one, and allowing this false point to become known. The splendid co-operation between the Naval and Military forces is very noticeable, and the sudden and unexpected seizure of the Canal by the naval authorities is an example of how such an operation ought to be done. The greatest forethought was displayed, not only in the bringing out of locomotives, rolling stock, and railway plant generally, but even wooden piers and wharves, to be erected at Ismailia, were brought out with the expedition, besides the necessary horse-boats, tugs, and lighters.

The composition of the expeditionary force was thorough and complete, and its organisation good. As in the year 1801, a force was ordered from India to co-operate with the English expedition, and the change in conditions caused by the introduction of steam enabled this force to arrive exactly as intended, and to take its share in the events of the campaign—very different to the uncertainty and doubt that existed in 1801 as to the whereabouts of the Indian contingent of that day, and its non-co-operation.

In this expedition no question arose as to the command of the sea, as the Egyptian forces were entirely on land. The transports thus made

their way independently from their port of sailing to their destination, and there was no delay due to the assemblage of convoys.

The success of this expedition was so rapid and decisive, that there has sometimes been a tendency to underrate its difficulties, and to consider it as an easy "walk over." It will, however, be seen from the foregoing, that the chief causes of the rapid and successful issue were the thoroughness and care with which all the plans were laid, the smartness with which the expedition was despatched, the sound strategical ability which marked every move on the board so far as our forces were concerned, the really excellent co-operation between the Army and Navy, and the spirit of dash and energy which animated all concerned. Fortune also greatly favoured the British, for the blocking of the Canal might have been affected at any moment by Arabi. This would have seriously deranged all the plans; but happily, the influence of M. de Lesseps, intent merely on preserving what he considered his own property from injury, and probably firmly believing that the British would never dare to violate the neutrality of the Canal, averted such a calamity, and the landing on the Egyptian flank was effected.

The temporary blocking of the Canal—owing to the presence in it of the French Messagerie's steamer "Melbourne," whose captain refused to "tie up" to allow the fleet of transports to pass, by the delay it caused and the derangement it effected in the British plans—not only illustrates how very serious it would have been had the Canal become entirely blocked, but it brings forward another point, which is, that nothing is more hampering to warlike expeditions than the interests of Neutrals. As in the present case, these interests may give rise to the most vexatious restrictions and delays, while it may not be expedient to use any compulsion, or to take any active measures against persons thus situated.

It is worthy of note that, while this flank movement was taking place, Arabi was kept occupied by considerable activity on his front near Alexandria. Our foothold at that place was the base of the whole expedition, and this fact clearly shows the vast importance of establishing, if possible, some sort of base on the enemy's coast, as a preliminary to the main expedition, even though it be not intended to prosecute further active advances from that base, but merely to use it as a cover for other and more rapid and decisive operations elsewhere.

#### SECTION IV.—GENERAL REVIEW OF THE EXPEDITIONS OF THE PAST.

Before looking forward to the possibilities of the Future, it will be well to look back for a moment upon the general history of the Past, as regards descents upon hostile coasts. And the first point that strikes the observer is the universality, so to speak, of such operations. Since those early days, when the Grecian heroes made their expedition to Troy, history records hundreds of attempts made over sea by nation against nation: some successful and some otherwise, some on a large scale and with great ulterior consequences, as the Norman Conquest of Britain, and others small, and long since passed out of recollection. Scarcely a stretch of coast line of any continent but has its history of

sea operations, and the landing of forces, not always of a foreign nation, but sometimes, as in the Southern States of America, in connection with the operations of Civil war; while there hardly exists an island of any size, value, or importance, which has not, at some time, been the object of an expedition by some nation. It is interesting, too, to note, since Britain became a Maritime Power, how her expeditions have made themselves felt in almost all parts of the globe. On the American coast her operations have been carried on from the St. Lawrence in the North to Monte Video in the South. On the coast of Africa, not only has the Northern shore of Egypt been twice invaded by the British, but expeditions have been landed on the East coast at Suakim, and, on the West, on the Gold coast. In Asia her long arm has reached, on two occasions, as far as the coast of China; while nearer home, the coasts of the Netherlands, France, Spain, Turkey, and Russia have all, at times, been the scenes of the landings of British troops. Such a retrospect clearly shows the extreme probability amounting, it may be said, to certainty, of future combined expeditions over sea for the Navy and Army of this country.

And our retrospect shows up with great clearness how greatly the success or failure of such expeditions depends on personal character and qualifications. To confine ourselves to instances we have quoted, when the resolution and enterprise shown by Abercrombie are contrasted with the vacillation and indecision of Sir J. Mordaunt, with his constant councils of war; when the clearly thought-out plan and decision and vigour of execution of the Egyptian expedition of 1882 are compared with the aimlessness and wavering which disgraced the British name at Ferrol and Cadiz; and when we remember, above all, that the rank and file of the unsuccessful expeditions were as brave and willing as those of the successful ones—in fact, Abercrombie's troops were actually the same that had been engaged in the Cadiz and Ferrol attempts—we see the immense importance of personal character.

And again, it is clearly apparent how the circumstances of each expedition differ, and in how many respects from those of all others. So complex are the conditions which govern their final result, that any attempt to lay down hard and fast rules, which shall be applicable to all cases, is plainly impossible. The boisterous surf of the Tunis coast and Aboukir Bay during the prevalence of northerly winds, and of Cape Breton Island, set up very different conditions to those prevailing in the smooth waters of Lake Timsah. The troop-crowned sand hills of Aboukir, differ much from the deserted beach near Eupatoria, and as much more from the sleeping towns of Ismailia and Port Said. Manifestly, all that can be done is to attempt to indicate a few general principles.

Looking back to the days when steam power was unknown, and comparing them with the present, we see the immense power which expeditionary forces have now at command in the way of certainty of transport to their destination by any fixed date, and the speed with which the seas can be traversed. No longer at the mercy of winds and currents, an expeditionary force is now a mobile instrument in the hands of its commander, capable of being placed at will exactly where required, and

rapidly transferred from one point to another. Moreover, there is now the certainty of co-operation, if so required, between forces starting from points far apart, and the power of threatening one point of a hostile coast, and then effecting the actual descent upon some quite different spot.

Our gallant ancestors—dependent upon winds and weather, whose ships were small and often unseaworthy, and whose arrangements for landing were much less complete than those of more modern days—had far greater difficulties to contend with than we, their descendants, and altogether it appears that the tendency of the march of time has been in favour of the oversea expedition.

We see also the importance and advantages of absolute secrecy when such movements are in contemplation. Probably the very best form of secrecy is to allow the transports to sail—as was done in the Rochefort expedition—with sealed orders, not a man knowing the destination whither he is bound.

It is curious to think that, at the very moment when these lines are being penned, a Japanese expeditionary force is, in all probability, on its way to effect a landing on the Chinese coast. Before this is read, there may have been events in the East which may shed a bright light on the subject now under consideration.

The necessity of making certain of the command of the sea before attempting to risk an expeditionary force across its waters has been already referred to, and has been so clearly shown by Admiral Colomb that no further remarks on this point seem necessary.

One important point to be always borne in mind is the extreme value attaching to a point of landing affording a sheltered landing-place, and smooth water for the operation. The best arrangements in the world will be of no avail should a heavy swell roll in from the sea, and break upon the beach, while a delayed landing not only permits of the enemy making preparations to meet it, but also tends to detract from the dash and spirit of the invaders. Further, any interruption caused by weather, while the force is still only partially ashore, or even if the men are all ashore but without their transport or stores, may seriously imperil the success of the expedition. The selection of the place where the landing is to be actually effected will always be a matter of great responsibility and difficulty. Shoal water, as we have seen in the case of Sfax and Aboukir, is a great drawback to such operations, as it prevents any co-operation—except at long ranges—from ships. Undoubtedly, for an important expedition, it would be well, if possible, to capture some harbour for this purpose.

The advantages of rehearsal of the operations of landing would, undoubtedly, be considerable, were there time to carry out such a preliminary; but this would seldom be the case. Should, however, delays occur, which cannot be avoided, it would be well to utilise any such opportunity which may occur to practise the force in rapid disembarkation.

It seems almost unnecessary to point out the great importance of getting ashore unopposed, if possible, by skill or stratagem. A frontal

attack on a position is never a good thing to make, and what attack on land could be so formidable or difficult, to the attackers, as General Amherst's or Sir R. Abercrombie's hardy enterprises?

The importance of the provision of sufficient land transport with the expedition, to enable the force to move forward at once, is another point that cannot fail to strike the reader. Often when a successful landing has just been effected, an advance *at once* may complete the overthrow of the enemy, while a delay leads to prolonged operations.

It is noteworthy that, both in the case of Aboukir and Cape Breton, the dashing and successful landing seems to have been succeeded by a period of somewhat extreme caution on the part of the commander. Perhaps, in both cases, they felt in their inmost hearts that their enterprises had been somewhat too venturesome. Every endeavour must be made to get the actual landing done as quickly as possible. This is best done by having plenty of large boats, and landing on as broad a front as possible. There is comparatively little difficulty in arranging this with infantry alone, but the mounted corps require much more time to disembark, on account of the horses, harness, carriages, etc. Some sort of wharves or jetties are of great use in facilitating debarkation of stores, and wooden ones should, as a rule, accompany the expedition, as was done in the 1882 expedition to Egypt.

The provision of fresh water on any open beach is generally a difficulty, as we have seen in several of the examples quoted, and some provision for a good supply to be sent ashore with the troops, or to meet them at some given point after landing, should always be made.<sup>1</sup>

The question of rations is one upon which some light is thrown by the experiences of the French in China, in 1860, when the troops ashore, who landed with six days' rations carried by each man, were nearly starved through these going bad; while the English, who landed at the same time, with only three days' supplies, were, on the whole, much better fed.

The absolute necessity of a proper preliminary reconnaissance, both of the proposed landing place and also, if possible, of the country just adjacent to it, is well demonstrated by more than one of the instances quoted.

It is the experience of all expeditions that the cavalry and artillery, and especially the latter, take far longer to embark and disembark than do the infantry. This difficulty is chiefly in connection with the horses, and there would appear to be great room for improvement in the methods of dealing with them. Slings them up singly through the hatchways and lowering them into boats or lighters is far too slow when, as in the present days, speed of disembarkation is a desideratum.

When the ships taken up as transports are being fitted up for the reception of troops and stores, there should be no insuperable difficulty in cutting suitable horse ports in their sides on the main deck, and both forward and aft of the engines. These ports should be cut in both sides of the ship. In addition, each ship should take out at least four good

<sup>1</sup> A condenser ship accompanied the Egyptian Expedition of 1882.



horse gangways and some decked lighters. Probably such arrangements would greatly accelerate the speed of embarkation and disembarkation of mounted troops. In the case of high ships there is little difficulty or danger, if in smooth water, in inclining them slightly, so as to reduce the difference of level between these main-deck ports and the lighters; but, in this case, the gangways on one side only of the ships can be used.

This point, of what is the best and more rapid method of shipping and unshipping horses, is one which does not appear to have ever been worked out experimentally in peace time. It seems to have always been taken for granted that mounted corps must necessarily take a very long time over the operation, and the only experiences available appear to be those gained in active service itself. The subject is one of great importance, and especially so to the mounted corps themselves, and it is suggested that a committee should be formed in time of peace, with power to ascertain, by actual experiment, the best and quickest way of carrying out this operation in the future. They should have the use of an average merchant steamer, such as is likely to be taken up for transport purposes, with power to make such structural alterations as they may consider advisable, and they should have at call at least a squadron of cavalry and a mounted battery of artillery, both of which branches of the Service should be strongly represented on the committee.

The discipline of the troops after landing should be strictly looked after. Many cases have occurred when, in the confusion after a landing, the troops, feeling their feet once more on shore after the constraint of shipboard, have broken more or less through the bounds of discipline. Liquor stores, etc., are sure to be found in towns, and the utmost vigilance will be necessary on the part of every officer on these occasions, unless the landing happens to be on an open coast. Providing plenty of occupation for the force from the moment of landing, if an advance at the moment be not practicable, is one great safeguard, and much may be done in the mending of roads, and improving of communications generally, combined with plenty of guards, piquets, and outposts, to keep all the troops, not required to assist in the landing of stores, employed.

Taking things all round, it does not appear too much to state that the Egyptian expedition of 1882 appears to embody in its arrangements and execution the greater part of the points indicated by previous history as essential to success, while most or all of those which we have seen to be detrimental have been avoided. It can only be regarded as an excellent model for future expeditions.

It is worth noting what superiority a modern sea-borne expedition possesses in the matter of mobility over the land forces. Probably in all countries the communications around the coast-line are very indifferent, and the transfer of troops from one point to another along the coast by land is a slow and difficult operation. But, on the other hand, an expeditionary force, packed in swift steamers, is capable of being shifted in a few hours from any point to some other widely separated from it. The Land Forces of the Defenders, once set in motion towards any given point of the coast, cannot readily be afterwards diverted.

The whole of the history of the past serves to show how splendidly our brothers-in-arms of the Navy have always co-operated with the Land Forces. This hearty co-operation has again and again been the foundation of the success of expeditionary forces. The gallant and sailor-like spirit of our Navy never shows itself to better advantage than when performing willingly and cheerfully the more or less irksome duties in connection with the transport, landing, and re-embarking of troops and stores.

SECTION V.—ON THE BEARING OF THE LESSONS THUS DEDUCED  
UPON SIMILAR OPERATIONS WHICH MAY BE UNDERTAKEN  
IN THE FUTURE.

It has already been pointed out that the expedition to Egypt of 1882 may be regarded as affording a most excellent practical example of the application of almost all the foregoing deductions, to an expedition conceived and carried out upon a large scale. The success of this expedition, in which most of these points were actually tested, would appear to sufficiently guarantee their general soundness, and that but little mistake will be made if, in the inception and execution of future expeditions, the general lines of this one be taken as a guide.

But the world does not stand still. Twelve years have now elapsed since that novel form of advanced guard—that procession of great ships, conveying lighters and landing stages, battalions of infantry, batteries of artillery, and squadrons of cavalry—steamed slowly down the Suez Canal from Port Said to Ismailia. During those twelve years many developments have taken place in matters of material; the speed of ships, especially of ships of war, has greatly increased; the slow and clumsy muzzle-loading heavy guns used at the bombardment of Alexandria, have given place to far more powerful guns on the breech-loading principle, and these again, in their turn, are being superseded, so far as the medium and smaller natures are concerned, by the terribly rapid and powerful quick-firing guns—wherever we look we see that the maxim of old Horace, written many hundreds of years ago, *Tempora mutantur, nos et mutamur in illis*, still holds good, and that the current of the stream of Time and Change is flowing now even more rapidly than in the old days long ago.

It may, therefore, not be unprofitable to consider in what way the changes and tendencies of the present day, may affect the designs and conduct of expeditions of this nature in the future.

The chief of those changes affecting the present subject may be summarised as follow:—

- (1)—Improvements in marine steam-engines and boilers, and the consequent endowment of ships and torpedo-boats with speeds entirely unknown a few years ago.
- (2)—Improvements in land steam-engines, with special reference to road and agricultural engines, and the increased powers which these now possess for transport purposes.
- (3)—Improvements in weapons of war, including the introduction of magazine rifles of quick-firing guns possessing great

rapidity of fire and great range; the introduction of smokeless powders, enabling these guns to be fired with great rapidity when required, so that any area exposed to their fire can be kept under quite a rain of projectiles; improvements in the details of submarine mines and in the size and speed of marine torpedoes, etc., etc.

- (4)—Improvements in the ordinary means of communication; the introduction of telephones, portable and capable of being used in the field, etc., etc.

- (5)—Minor details, such as balloons, etc.

(1)—The improvements in naval architecture, and in marine engines and boilers, have not only resulted in an increase in the average speeds of large ships, but have given birth to the modern Torpedo-boat, and still more modern torpedo-boat Destroyer, these latter being craft lightly built and lightly armed, but capable of travelling at speeds of over thirty miles an hour.

It appears quite possible that vessels of this nature may play a very important part with reference to future oversea expeditions, both for the attacker and the defender.

In favour of the attacker, we find that his expeditionary force is now under full command. The modern, well-found steamers can keep together without the slightest difficulty, if required so to do. They will thus be easy to convoy, can make the land at any given point and hour desired, and after making an apparent descent upon one portion of the coast sufficient to attract the attention and troops of the defenders, can with great rapidity transfer the blow to some other and quite different spot, where the real debarkation can be effected.

The swift destroyer will afford the very best means of reconnoitring the coast preliminary to a descent. These vessels need only precede the fleet by a few hours, just sufficient time to effect the reconnaissance before the actual arrival of the transports, but so quickly that almost before notice can be given of the threatened point the transports will be at hand. They will also be useful for chasing and stopping merchant vessels and others belonging to the enemy, which might otherwise give warning as to the whereabouts of the fleet. The presence of such vessels with the convoy will also be useful and necessary to keep the enemy's torpedo-boats at a distance.

In favour of the defensive nation we have the fact that, no matter how much the command of the sea may apparently be in the hands of the adversary, it will be almost impossible to keep the modern swift torpedo-boat from breaking out. Lying as they can at numerous points along any coast and almost invisible at night, these small vessels will prove very valuable in obtaining information when the larger ships are driven off the sea; and, armed as they are with weapons quite capable of sinking most merchant ships, they may inflict very serious damage upon the expeditionary force by attacking and sinking some of the transports. They may, by dash and boldness, even delay the sailing of the force, by attacking the transports while fitting out in our own harbours.

The sailing of the great Spanish Armada was delayed for a whole year by the bold action of Drake, who attacked Cadiz, where the fleet was fitting out, and destroyed no less than 100 ships laden with provisions and stores. The torpedo-boat is well adapted for a bold stroke of this kind, and our coast defences, though well organised and arranged for dealing with big ships, are not yet really certain and satisfactory, where the stopping of these swiftly flying and almost invisible nocturnal visitants is concerned, while many of our mercantile ports are almost undefended against craft of this nature.

The probable necessities, then, of future expeditions, so far as their sea transport is concerned, will be as follows :—

In the first place, a fixed minimum speed must be required from every transport before being chartered, so as to ensure uniformity of speed.

*Secondly*—The greatest possible secrecy should be observed as to the ports at which transports are being fitted out, and as to the possible date of embarkation or sailing.

*Thirdly*—The actual embarkation of troops should be effected with the utmost possible rapidity, and the ships should sail at once for a rendezvous with sealed orders.

*Fourthly*—Those from each separate port should start simultaneously and under good convoy, comprising plenty of swift craft. N.B.—It is assumed that the command of the sea, so far as the presence of big ships upon it is concerned, has been already assured, prior to the undertaking of an expedition.

*Fifthly*—The enemy's coasts should be given as wide a berth as possible, a detour being made if necessary to keep the fleet outside the radius of torpedo-boat action, and the descent upon the coast, if attack by torpedo-boats be a possibility, should be effected at right angles to the general coast line, so that as short a time as possible is spent within the radius of their action.

*Sixthly*—The reconnoitring party, in swift vessels, need only precede the fleet by so much time as will allow of their reconnaissance being completed by the time the transports arrive.

*Seventhly*—All ships likely to give warning to the enemy must be overhauled and made to keep with the convoy.

*Eighthly*—Arrived off the land, a careful watch must be kept by a division of swift cruisers lest an enemy's boats should approach from seawards, and do mischief, while attention is directed to the landing.

Another class of vessel which has been quietly developing of recent years, and which is likely to prove of very great use in facilitating debarkations, is the large flat stern-wheel steamer, now considerably used on the African and some South American rivers. These vessels can be obtained of great size and power. For instance, some in the market are 150 feet long by 30 feet broad, displacing 150 tons with a draught of water of only 1 foot 3 inches, and a speed of 15 miles an hour.

The enormous advantage of this class of vessel over the ordinary steam launch of less than one-tenth the tonnage, and less than half the speed and power, and yet drawing at least 4 or 5 feet are obvious, and all

future expeditions should be provided with a considerable number of these boats; each would be capable by itself of landing half a battalion at one trip, and, with a decked lighter lashed on each side, would form an ideal landing raft for cavalry and guns.

(2)—We now come to the improvements in road steam engines, which, of late years, have been considerable.

An interesting paper appeared in the *Journal of the Royal United Service Institution*<sup>1</sup> for August of the present year, giving a large number of statistics as to the capabilities of certain of these engines which had been used during the manœuvres of 1893. It is there shown how efficient and cheap this method of transporting stores is, compared with the cost of horses.

But this is not the only use to which these engines can be put. Fitted with winding gear, a few of them on the beach could greatly assist in warping boats, lighters, etc., ashore, or in dragging guns and other heavy weights up slopes and through soft sand, to the immense saving of horses. They are also most useful for pumping water; and, finally, fitted as they can easily be with a dynamo, they can be used to generate electric light wherever they may be. The value of electric lights in facilitating work at night, which will probably be necessary shortly after landing, cannot be overrated. Such a light, too, arranged to sweep the country in front of the outposts is of immense moral value, as tending to prevent "scares" among the sentries, where young soldiers are concerned, and consequently enabling the troops to get better rest.

On the whole, it may safely be said that in all future expeditions of this nature full advantage should be taken of these useful machines.

(3)—The improvements in weapons of war, even in the short space of twelve years, are of the most remarkable character. They include the introduction of magazine rifles for the infantry and of quick-firing artillery for ships and boats, in addition to new smokeless propellants giving great velocity to the projectiles and high explosives for the bursting charges of shells, rendering these latter more formidable than ever before.

Generally speaking, it would appear that so great is the power given by all these modern weapons for sweeping with a hail of projectiles any given area, that any attempt to land troops in the face of an enemy thus armed must now be considered almost impossible, owing to the tremendous loss which must certainly be sustained. Certainly, the covering fire from ships and boats would be more powerful than formerly, but the high velocity guns of ships are not very formidable against entrenchments, and it may safely be said that Amherst's and Abercrombie's exploits are never likely again to be attempted.

But it will always be necessary to make preparations for covering the landing of the troops by means of shell fire, and the use made by the French at Sfax of heavy howitzers mounted in flat sheet-iron barges, capable of being towed into shallow water, is well worth consideration. It is suggested that this point also, viz., the best means of covering a landing party by fire from vessels afloat, is also one which should be made the subject of experimental investigation.

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<sup>1</sup> By Lieut-Colonel Templer, 7th Batt. T.R.R.C.

One conclusion absolutely forced upon the attention in reading the experiences of the past, is the very great importance of securing as a landing place some spot where there will be no interruption from roughness of the sea. Such spots, where they exist along coast lines of civilised nations, have nearly all been utilised as harbours, and in all probability the seizure of a harbour, or the estuary of some river, will always be the first objective point of our future expeditions.

It is in such positions that submarine mines may be met with, and their effects both in the form of actual destruction, and also in the delay which the mere suspicion of their presence is likely to cause, will be tested.

(4)—*Regarding means of communication with distant points, the following improvements have been made. Telephones suitable for field service have been introduced, and great advances have been made in the speed of laying down field lines of wire, which can now be laid at the pace of the trot.*

There can be no doubt that the subject of maintaining rapid and continuous communication between the commander and the front and flanks of his army is one of the very highest importance. It is interesting to see that the French at Sfax made a great point of the keeping up of communications all along their line from flank to flank.

There does not appear to be any advance in methods of communicating between ships or boats and the shore, the semaphore, and signalling by Morse alphabet, using either flags or lamps, being still the only recognised methods. On shore the portable telephone has been considerably developed by the French, but it appears very doubtful whether it is any improvement on the telegraph, when all things are taken into consideration, the latter being so reliable and accurate, while telephonic communications are very liable to be inaccurate owing to wrong delivery or mishearing of the messages.

(5)—*Balloons for reconnoitring purposes are likely to be much more largely used than in former expeditions. No example appears to exist as yet, of their being used from ships, but now that masts and rigging have largely disappeared, and that the advantage of large, flat craft, such as special lighters, on these occasions, are beginning to be recognised, it will probably be found that a balloon equipment might with great advantage be included among the leading ships of the next expedition, modified by the addition of a suitable lighter to carry the holding down cable, and from which the actual ascent could be made.*

#### SECTION VI.—CONCLUSION.

Without attempting to enter into details, it appears that the following general principles have been established in the foregoing pages :—

(1)—That oversea expeditions will assuredly play a part in our history in the future, as they already have in the past, and that the subject is consequently well worthy of study.



(2)—That before any such expedition is attempted our command of the sea must be established.

(3)—That in the inception and preparation of such an expedition the highest wisdom of the country should be consulted, in order that the strength of the composition, and equipment of the Force may be sufficient, and suitable for the work to be done. The numbers should not be excessive, but strictly limited to the actual requirements.

(4)—That, once decided upon, the whole available resources of the country should be put into the work.

(5)—That the commanders, both naval and military, should be specially selected men of known character and resolution, and that previous experience of similar work is of great value.

(6)—That the preparations be most thorough in character, and as rapid as possible.

(7)—That absolute secrecy be observed, not only as to the possible destination of the expedition, but as to its points of assembly, probable date of sailing, and ports where fitting out. An appeal to the patriotism of the Press should be made in the very earliest stage of the proceedings.

(8)—That deliberate frontal attacks being now out of the question, the fullest use should be made of the splendid mobility and certainty conferred by modern steam power on an expeditionary fleet, to distract the enemy's attention from the real point of attack, by false attacks and feints upon other points of his coast; for in this great mobility and self-containedness, so to speak, of the modern fleet, lies its real supremacy over the scattered and immobile defenders of the coast line, and the heavy inertia of a Land Army once set in motion in a particular direction. In some cases a double landing may have many advantages—a foothold at one place being necessary to draw the enemy away from the other, whose capture is intended.

(9)—That owing to the power of modern weapons, stratagem will be of more importance than ever in the future, and that every endeavour should be made to get the troops on shore unopposed.

(10)—That smooth water is essential for a proper and successful landing, and that no pains should be spared to secure a harbour for this purpose.

(11)—That each unit of the expeditionary force should be embarked complete, and with its own supply of provisions, tentage, and land transport, besides suitable craft for landing.

(12)—That a large supply of roomy flat boats, stern-wheel steamers, and lighters should be provided and carried with the transports, each ship carrying its own.

(13)—That the utmost possible speed should be used from the moment the undertaking is decided upon until the objective is attained.

(14)—That reconnaissance of the proposed landing place is essential, and should be swift and rapid. It is suggested that this should be practised by officers in time of peace.

(15)—That it is of the highest importance to land a good water supply with the troops, and that their rations and spare ammunition

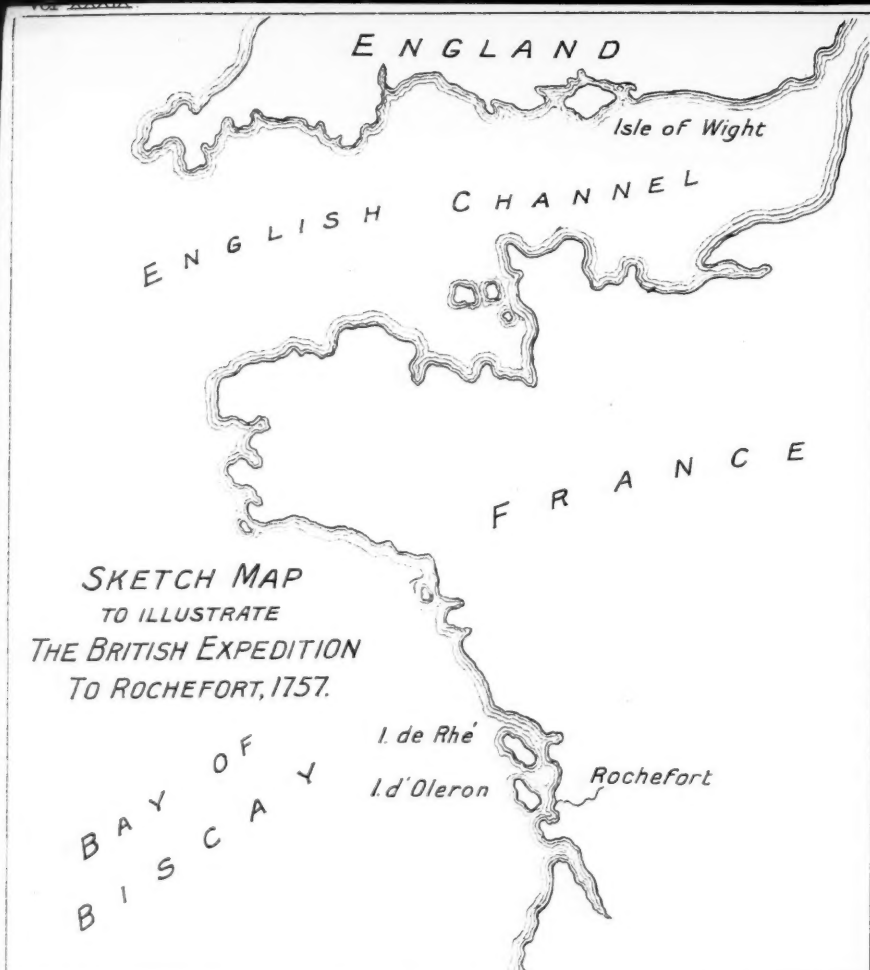
should also be landed at once, and that proper and efficient provisions for the maintenance of discipline should be made. Plenty of employment for the troops is a great safeguard.

(16)—That readiness should be aimed at, and that stores of the necessary flat boats, etc., should be kept if possible; or, if that be not so, that specifications should be kept in readiness for the builders.

(17)—And that, with regard to certain points which experience has shown to be weak—*e.g.*, the time taken to embark and disembark the artillery and cavalry, and other similar points—these should be investigated experimentally in time of peace.

Owing to the complexity of the subject, and the immense number of details varying in each and every expedition, the subject is not one which lends itself readily to broad generalisations, or to the tempting flights of inductive reasonings. It has been endeavoured to exhibit the subject in its true perspective, and in its real relation to the Geographical and Physical aspects of Nature, and the influences of Human Character and Disposition, which, after all is said and done, will, in the future, as in the past, always be the dominant factors in deciding the fate of expeditions and the ultimate Destiny of Nations.

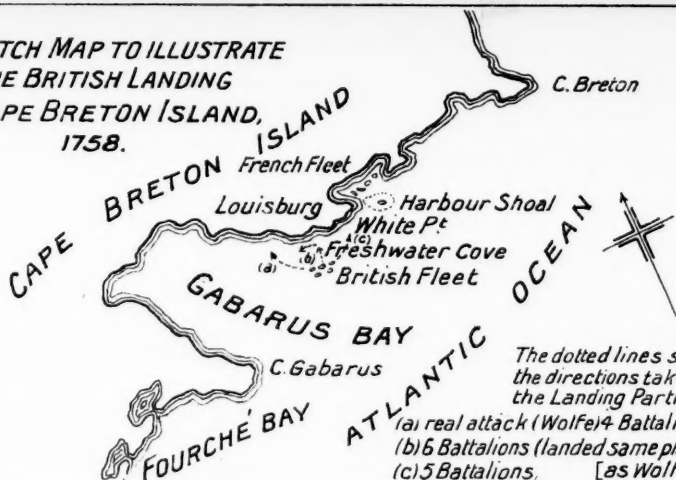




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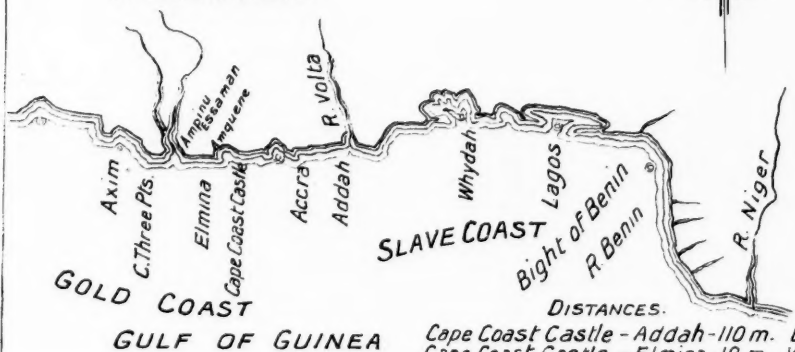
SCALE APPROXIMATELY 4 MILES TO 1 INCH.

SKETCH MAP TO ILLUSTRATE  
THE BRITISH LANDING  
ON CAPE BRETON ISLAND,  
1758.



The dotted lines show  
the directions taken by  
the Landing Parties.  
(a) real attack (Wolfe) 4 Battalions,  
(b) 5 Battalions (landed same place  
(c) 5 Battalions. [as Wolfe]

SKETCH MAP TO ILLUSTRATE  
THE BRITISH LANDING  
AT ELMINA. 1873.



DISTANCES.  
Cape Coast Castle - Addah - 110 m. E.  
Cape Coast Castle - Elmina - 10 m. W.

SKETCH MAP  
OF THE  
TUNIS COAST



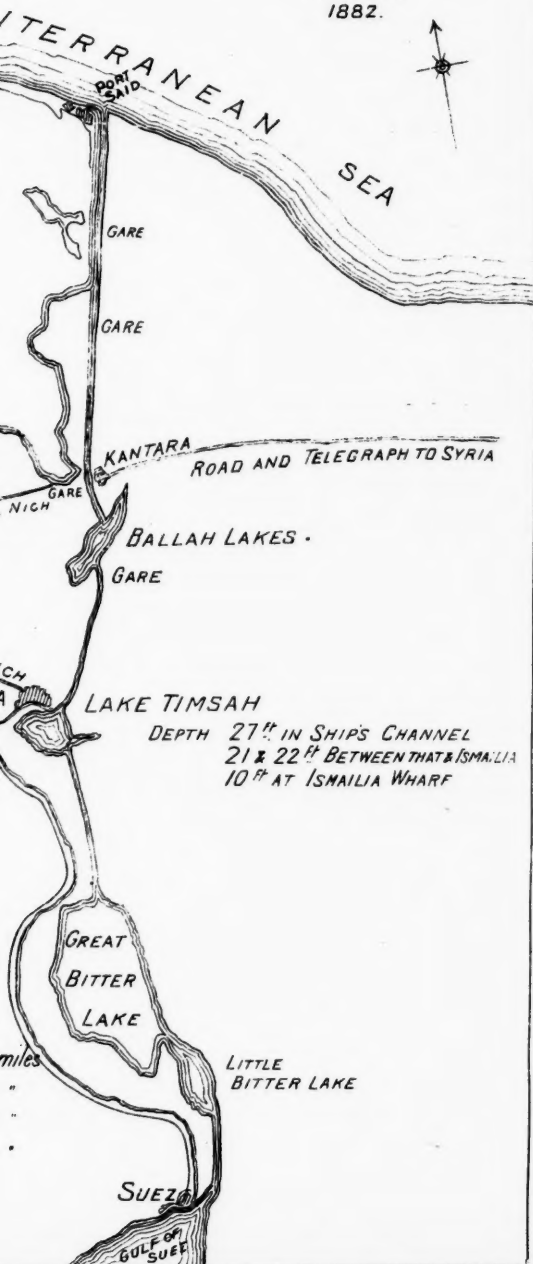


TABLE OF DISTANCES:

Alexandria to Aboukir Bay	30 miles
Aboukir to Port Said	120 "
Port Said to Ismailia	42 "
Ismailia to Suez	44 "



SKETCH MAP  
OF THE SUEZ CANAL  
TO ILLUSTRATE THE  
BRITISH EXPEDITION  
TO EGYPT  
1882.





## FIELD ARTILLERY FIRE AND OKEHAMPTON EXPERIENCES.

*By Major A. J. HUGHES, R.A.*

Wednesday, March 27th, 1895.

Lieut-General E. F. CHAPMAN, C.B., in the Chair.

GENTLEMEN, before entering on the question of effects, it seems necessary to briefly describe the latest changes that have been made in material. They are, I believe, unknown to many outside the artillery, and though only a technical matter, are interesting to all; for, as pointed out by Colonel Walford in a lecture delivered here in 1891, if we examine the changes that have taken place in tactics in the past, we shall find that they have usually been brought about by improvements in material.

*Material.*—Every effort has been made of late years to obtain simplicity, both in regard to equipment and ammunition. Simplicity, however, is very hard to hold, for no sooner is it apparently grasped than new inventions are made, and it vanishes again. For instance, the new H.A. equipment is very simple, but already quick-firers are looming in the distance.

The following is a short description of the gun and equipment:—

The gun is a short 12-pounder: length, 59 inches; weight, 6 cwt.; the charge, 12 ozs. of cordite, giving a M.V. of 1,500 f.-s.

The carriage is rigid, and quite as simple as that of the old 9-pounder. It is fitted with shoe brakes, and the recoil is about 2 to 3 feet. On each side of the brackets is a pocket to hold three rounds (two shrapnel, one case). This ammunition will always be immediately available.

The limber is fitted for pole draught, and has only one box, with a partition in the centre. It carries forty-four rounds, and the wagons ninety-two. Thus, with the six on the gun, a total of 142 rounds per sub-division are carried; this shows a great advance on the 108 rounds now carried, and places us well in front of other nations. At the same time, the weight behind the team has been reduced to about 31 cwt. This gain is in a great measure due to the introduction of cordite, the cordite charge being about a quarter that of black powder.

Only shrapnel shell and case shot are carried; further, the shrapnel can be all carried fuze with the time and percussion fuze.

The Service 12-pounder shrapnel are at present used, but experiments are being made to obtain an improved one. The equipment has been in use for two years, and owing to its general handiness and simplicity was very much liked. The results obtained at practice appear quite up to the average of those with the Service 12-pounder.

Notwithstanding that the equipment is so satisfactory, and exhibits a great advance, it already appears doubtful how long it will maintain its pre-eminence. Abroad signs are not wanting to show that before long a field quick-firer will be introduced. It would, perhaps, better be

designated as a rapid loader, for none of the field quick-firers are true quick-firers in the same sense that a naval or garrison gun is: in the latter, the recoil is entirely absorbed by the mounting, and the layer is undisturbed; whilst in the former, although the recoil is absorbed by buffers, brakes, and a spade at the end of the trail, there is always a considerable amount of kick, and the gun must be relaid, except at short ranges, or when firing case. This power of a very rapid fire, if suddenly attacked at short ranges, and the saving of labour of running up, are the main advantages to be gained; the latter is a constant advantage, but the former would only be of use in exceptional cases. For the main fighting the ordinary breech-loader can fire quite as rapidly as can be observed and regulated. Under these circumstances it does not appear desirable to adopt a quick-firing equipment, unless the gun is as powerful as the ordinary field gun, and the equipment carries an equal amount of ammunition for the same weight behind the team.

Of late years great strides have been made in their manufacture, and many of the difficulties have been successfully overcome. The French apparently consider them overcome, or, at least, nearly so, for it has been stated in French papers that orders have been given for a large number.

The details of some of the present field quick-firers are given in the tables.

The general design of the Maxim-Nordenfeldt is shown on the diagrams, which have been kindly lent me by the company. The gun is held in a cradle, and there are two hydraulic buffers, one on each side; on firing, the gun first recoils on the top carriage in a manner somewhat similar to the 12-pounder on the Mark II. carriage.

The breech action is very neat: one single motion of the handle unscrews the block, opens the gun, and extracts the empty case; a reverse motion closing and locking it. The breech mechanism is also such that in case of a miss-fire the firing pin can be re-cocked without opening the breech. The carriage is fitted with a slow-motion traversing gear. It is fitted with the Buffington brake, and has a broad trail with a plough at the end.

There is a seat on the trail, and after a few rounds the carriage does not recoil more than a few inches, and it is possible for the layer to remain seated. It is fitted with removable shields, but these are not carried on the carriage.

I am sorry that through an error the diagram of the Schneider equipment has not arrived. These photographs show it, but I am afraid they are very small. It is remarkable for the position of the gun, which is set low, on a line with the centre of the axle, thus reducing the jump and consequent disarrangement of the laying to a minimum; at the same time, it has the disadvantage of reducing the command.

*System of Draught.*—The H.A. equipment is fitted with pole draught; it has also, been decided to introduce it for the field artillery. Up to now we have been the sole possessors of shaft draught, and, though many doubted the wisdom of it, it held its own, until the drill of

wagon supply and consequent necessity of rapidly unhooking the teams brought the question to the front. For the last three years extensive trials have been carried on with various systems. The one most liked was the Swiss, and the new H.A. limbers are fitted with a modification of it. It consists of a pole of medium length, supported by a wooden cross-bar buckled to the bottom of the wheelers' collars. The pole chains are not attached to the collar, but connected by a strap directly with the breechings. The strain of stopping the carriages is thus taken entirely by the breechings. The trace draught is similar to that with shafts, except that those of the wheelers are hooked to swingle-trees. To unhook, the pole chains have to be cast loose and the wheelers' swingle-trees unhooked; the horses can then move straight to the front. All horses carry breeching and have exactly similar harness.

*Smokeless Powder.*—The weight gained has in the new H.A. equipment been utilised in increasing the rounds carried, and reducing the weight behind the team. With regard to the field artillery, the weight gained will be utilised by employing a 15-lb. shell, the 3 lbs. saved in the cartridge being added to the shell. At the same time the M.V. has been reduced to 1,550 f.-s. Last year one battery carried out its practice with such a shell, and the effects were good. Some probably may regard the reduction of the M.V. as a retrograde step. The arguments for and against high M.V. have been often put forward, and are well summarised in a lecture delivered here two years ago by Captain Headlam; and I do not, therefore, propose to go through them, but would only draw your attention to one of them, which the proposed change brings out very clearly, namely, "light shell."

The carriage and gun will stand a certain strain, which increases directly with the velocity and weight of shell. If you increase the one you must decrease the other. Now, it has been found that with the present equipment one can have the choice of a—

12-lb. shell and M.V. of 1,710 f.-s.

or a 15 " " " 1,550 f.-s.

and there is no doubt that the latter is the more powerful combination, because, first, each shell is 3 lbs. heavier, and secondly, the heavier shell having a greater transverse density preserves its velocity better, and at 2,000 yards has the higher remaining velocity; and, after all, it is high remaining velocity, and not muzzle velocity, that is the great desideratum. The results of experimental practice also show that the 15-lb. is the more powerful, for the proportion of throughs to lodges and strikes is greater with it than the 12-lb. Part of this, again, is probably due to the position of the burster; the extra weight having enabled the burster to be shifted from the head to the base, and yet preserve a large number of bullets.

Cordite, in common with all modern explosives, has the advantage of not exploding unless confined; therefore an explosion in a limber will be less violent than formerly. A few years ago a limber, packed with filled shell and cordite cartridges, was fired at by a 12-pounder with common shell. A hit was obtained and the limber destroyed, but the cordite did

not appear to have exploded with any violence. The burning cartridges were observed flying through the air, and some of them were even picked up unburnt. Out of four dummies at the limber, two were merely blown down, one was destroyed, and the other blown 6 yards. Neither the guns nor the detachments suffered any injury, although the limber was midway between the guns and only 5 yards in rear of trail. Had shrapnel been employed, the explosion would most likely have been even less. A high explosive shell was detonated in a limber, and the cordite did not even catch fire.

The erosion of the gun when using cordite does not appear more than with black powder, provided there is no escape of gas. When cordite was used with the old open vents they rapidly eroded, but now that a good gas sealing tube has been obtained, the erosion is stopped, and the vents wear well. Similarly, in the lighter guns, the bore does not get scored, as the driving band expands at once and apparently prevents all windage. The difficulty of the gas escaping past the driving band, and causing scoring, is obviated in the Maxim-Nordenfeldt Q.F. by the grooves being made slightly narrower at the muzzle than at the breech; by this means a continual compression is kept up on the driving band as the shell travels down the bore.

*Fuses.*—Only one fuse, the T and P short,<sup>1</sup> is now carried, and quite lately a change has been made in its manufacture that causes it to burn the same time in the air that it does at rest. This will enable us to use time shell up to about 4,000 yards in place of 3,200, and it is also probable that it will burn more regularly since the pressure of the air on the burning composition is removed.

*Projectiles.*—As regards projectiles, we have obtained simplicity, only shrapnel and case being carried in the H.A. equipment; and as soon as the present stock of common is exhausted the field artillery will be similarly equipped.

Foreign nations appear to be working on very similar lines, the French and German having abolished their ring shell. At the same time, however, they have introduced a high explosive shell, apparently with the object of reaching troops behind cover. Against earthworks, however, not much success has attended their use, either when employed as a time or percussion shell. When employed as a time shell, the idea is to burst it at or just beyond the crest and trust to the high explosive acting backwards, and so searching out the parapet. To be at all effective the shell must be burst exactly at the right spot.

Similarly, owing to the small burster and quick burst, the effect on earth from P shell, although much greater than when powder is used, is still small, and to produce any effect a large expenditure of ammunition is required, and batteries cannot carry this without displacing shrapnel. In speaking of the effect of projectiles, this question of the amount of ammunition necessary to produce a given effect is often lost sight of.

The small charges carried in field shells are hard to detonate—large charges, on the contrary, detonate easily; consequently, when one comes to howitzers the results are different. Here the charge is large and

<sup>1</sup> Time and Percussion.



velocity low; it is easy, therefore, to detonate, and acts violently in all directions.

For example, a parapet was fired at by the 6-inch howitzer. It had a command of 11 feet over the bottom of the trench. Twenty standing dummies were placed in the trench and twenty on the top step. The range was 2,300 yards. One round out of fifteen pitched on the reverse slope and demolished thirty of the dummies. Here is great effect from a single shell. Still, one must not forget that the expenditure of ammunition to obtain this single effective round was large, equal in weight to 120 rounds of 12-pounder, or rather more than one-sixth of the ammunition carried by a battery. Against troops in the open, the effects of shrapnel from field howitzers are less than those from a field gun, taking an equal weight of ammunition. Thirty rounds of 5-inch howitzer gave 238 hits on a line of forty standing dummies, with two supports, of twenty each, 100 yards in rear; range, 2,100 yards. For the same weight of ammunition a 12-pounder could fire 120 rounds, and undoubtedly the effect would be greater.

Against houses the high explosive shell, even in field guns, should undoubtedly be most effective, both on account of the moral as well as the actual effect produced by the violent explosion in the confined space. Hence its introduction should augment the destructive power of field artillery against houses, etc., which power had been somewhat reduced by the abolition of common shell.

The following results of an experiment carried out at Lydd in '93 and '94 are interesting. The old coastguard station was partially defended and fired at with percussion common and shrapnel. Part of the front had 2 feet of loose brick, and the other defended part loose shingle. The windows were boarded inside and out and the intervening space filled with shingle. It was first fired at, from a range of 2,400 yards, with percussion shrapnel. The shrapnel went through the wall, 14 inches thick, making a hole about 9 inches diameter, and then burst inside; the bullets entered wood, but as a rule did not lodge. The effect was the same when shell passed through the window, but it also blew down the inside boarding, and the shingle all fell into the room. The loose bricks stopped the shell at about the depth of a foot. At 1,500 yards the general effect was greater, the shells passing through the outer and knocking holes in the partition walls. With 15-lb. shell the effect was still greater. With common shell three hits were obtained in one part (two hours' defence), and the damage was such as to render it untenable; the front wall was wrecked and the whole of the partition wall between front and back brought down. Common shell, however, has the disadvantage that it is liable to set the village on fire, and thus render it impassable to our own troops. Shrapnel will not do this, and still its effect is sufficient to drive an enemy out.

The effect on the boarded windows is worth noticing. In the report of the Committee on the penetration of small arms, it is stated that 3 inches of shingle between  $\frac{3}{4}$ -inch boards completely stops the small-bore bullets. "Timber by itself is no longer of any use as cover at short ranges, owing to the great thickness required. On the other hand, a

much smaller quantity of timber, in the form of boards made into troughs, or wooden boxes, or hurdle boxes, with shingle or sand between, will completely stop the new bullets. Stockades of planks, with sand, shingle, or dry brick cores, will now replace the heavy timber baulks formerly used." The Lydd experiment shows that though such a stockade may be good against rifle fire, it would very soon be destroyed by that of artillery.

#### EFFECTS OF FIRE.

The conditions of peace practice are so different to those on service, that only the most general deductions can be made from many peace results. They are, perhaps, of more value to show the gain made year by year in destructive effect produced by improved training and material. But, even here, great care must be exercised, and large averages taken, or the deductions will be misleading.

One often reads in the papers the wonderful results of some special trial of a new gun, and comparisons are drawn between them and those obtained at ordinary practice, quite ignoring the fact that at these special trials everything is done to obtain effect.

Perhaps, on the whole, the effects obtained from artillery practice are more likely to be approximately realised on service than those of infantry practice. With reference to this question, the late General Brackenbury, in a lecture delivered by him in 1889, says :—" But first, a few words as to experimental firing, which, mind you, always tells against artillery in cases of comparison ; because fatigue, rapid movement, and the excitement of combat have a more detrimental effect on infantry than artillery fire. At short artillery ranges, with care, there is no necessity for very accurate laying, and at long ones the distance of the enemy has a tendency to prevent anything like agitation. The gunner is not always marching and running about like the infantry soldier, and, if he were, his beating heart and panting breath would have no effect on the steadiness of his weapon-

"On the other hand, every quickened breath or anxious heart-beat affects prodigiously the aim of the infantry rifle. I myself have seen troops, when within 100 yards of each other, missing almost every shot, simply because, being always on the look-out for a rush, they did not raise their rifles properly to their shoulders, or take aim at all. If two bodies of infantry, in almost any formation, were to shoot at each other at ranges from 600 yards downwards with anything approaching the accuracy of the practice ground, mutual annihilation would result ; but we know very well that nothing of that sort ever has occurred in war, and we can guess pretty well that it never will."

Again, losses do not affect the fire of artillery in the same proportion that they do that of infantry. It is said that 25 per cent. of loss stops the advance of infantry, but a battery can lose 50 per cent. of its men and yet its actual fire effect will hardly slacken.

In the description given by Major May in his "Achievements of Field Artillery" he says, speaking of the battle of Gravelotte, "Hasse's battery from the first sustained enormous losses. Two other officers were severely, and Captain Hasse himself, was slightly wounded. All the

officers' horses were shot, but, in spite of the sacrifices it had to make, the battery held its ground and maintained its fire with great effect." And again, at Spicheren, speaking of the two batteries that were first able to reach the heights, he says:—"Although these eight guns lost nearly half their gunners, fighting as they were within 800 yards of a line of French skirmishers in shelter trenches, the effect of their shells compelled the enemy by degrees to abandon the field, and the remaining four guns of the heavy battery were able to come into action too, and added their force to the power which was overpowering the foe."

In this respect artillery should make a further advance by the introduction of a non-recoil carriage, for one of the most exhausting labours of working the guns is that of running up. Thus in Egypt, in 1882, in the account of the action on the 24th August, we read the two detachments of the two guns of N Battery, A Brigade, became so exhausted towards the end of the day, on account of the heat and labour of running up, that first the drivers and then some marine artillerymen assisted them.

*Rate of Fire.*—At practice the series are so short, in consequence of the small amount of ammunition available, that the rate depends more on the ability of the Battery Commander to find the range and fuse quickly than on the working power of the battery.

At Okehampton in 1889 the average time in action was 17 minutes, in which time 20·5 rounds were fired; last year the time was only 8' 43" for 22·25 rounds; the time from action to first gun being 1' 10", and from action to ordinary fire 5' 53". The shortness of the series is all against large effects, for directly the range and fuse are found, that is, when the fire becomes effective, the series is stopped.

On the 29th of June, 1893, a battery fired 979 rounds, *i.e.*, nearly the whole of the ammunition with the battery and with the divisional reserve. The total time taken was 7½ hours, of which 4¾ was actual firing, the remainder being occupied in changes of position.

The same men were employed at the guns throughout the day, and the rate of fire was as great at the end as at the commencement. A few of the men complained of gun headaches, but the only ones who really required changing were the gunlayers, whose eyes got very tired, and it was found necessary to relieve them after every fifty rounds. The rate of fire at standing targets varied from six rounds a minute to 2·6, the average being 4·2, which agrees very closely with foreign estimates, the German regulations laying down four rounds a minute for a 6-gun battery. In Russia it is laid down that once the range has been obtained, a battery of eight guns must not exceed twelve rounds a minute; one of six, six to nine; but this rate must not be maintained for more than 5 minutes. Generally rapid fire is only to be used for short ranges.

*Cavalry.*—At the cavalry target the rate ran up to 13·5 rounds a minute. The average at this target of the batteries practising at Okehampton being nearly ten; with smokeless powder it will, doubtless, be increased.

The system now introduced for meeting an attack at close ranges—1,000 yards and under—is very simple, and is as follows:—

Previous to coming into action, three shrapnel, with fuses set at 2, are placed in a portable magazine (one of the leather cases used for carrying ammunition from the limbers to the guns). When the guns are in action, this magazine is placed close to the loading number. The left sight is fixed at 500 yards. Suppose the battery is firing at a distant target, and is suddenly attacked by cavalry, the order "Magazine fire" is given. On this the guns are at once turned on the cavalry, and the three rounds per gun already prepared are fired at the fixed elevation of 500 yards. The shrapnel having their fuses set at 2 burst at about 400 yards from the guns, and at such a short range the bullets cover about 300 to 400 yards, in depth; and with the rapid fire that can be kept up, in consequence of there being no delay setting fuses or sights, the ground from 400 to 1,000 yards should be well swept with bullets. When fused shell are carried, a battery will always be prepared for cavalry, as all the fuses can be set at 2.

*Artillery.*—The average results of the last three years, namely, 8·5 men hit out of 38 in 11'52, for an expenditure of twenty-four shell, may, I think, be taken as fairly representing what a 12-pounder battery can do under ordinary peace conditions in the time, and for the amount of ammunition expended. Guns are undoubtedly our most difficult target, both on account of the range (averages about 2,700 yards), and extent of ground covered by the target. The effects, consequently, compare unfavourably with those obtained at other targets; further, at Okehampton the ground is entirely unfavourable to ricochet. That ricochet does largely influence the effect on the target, is clearly shown by the fact that the results at practice grounds favourable to ricochet being year by year greater than at Okehampton, notwithstanding that the batteries change over. In an interesting experiment at Shoeburyness it was proved that the effect of time shrapnel, at a range of 2,000 yards, was 35 per cent. better over hard ground than over soft, at longer ranges the advantage is less on account of the increased angle of descent and lower velocity, and at ordinary practice the difference is probably not so marked. One of the hardest targets to obtain effects on at Okehampton is that of the guns on the Bluff, and the difficulty is chiefly one of ranging, due to there being a depression in front as well as in rear of the target. The guns themselves can generally be clearly seen, but unless the ground is known the dip short of the target can easily escape notice, and shell pitching in it, not being seen, are judged over, thus throwing out the ranging.

Sometimes the smoke, when it rises from the depression, is so thin, that the target shows up through it, thus the observer concludes the shell is over. Prince Kraft, in his thirteenth letter, draws attention to this, and relates two cases of this occurring—one at peace practice and one on service. Concerning the latter, he says:—"I once saw in action a considerable line of artillery, which was engaged near to me, firing for several hours too short, and this went on until I remarked it and informed them of it. The enemy had posted his guns on the further edge of a plateau, in which there were some deceptive depressions; while our

artillery was induced, by similar appearances of the smoke, to believe that they were standing close to the nearer edge."

This is clearly pointed out in F.A.D., which, when giving the requirements of a good position, says:—

In choosing a position the following points should be considered, but will seldom all be simultaneously obtainable, viz.:—

(1) It should be calculated to give full effect to the fire of the batteries.

(2) It should be difficult for the enemy to range on.

(3) The guns should, as far as is consistent with 1, be concealed from view.

Thus, after the chief consideration, *i.e.*, to obtain full fire effect, come deception, and, lastly, cover.

At long ranges the effect of artillery fire depends chiefly on good observation, in order that ranging may be accurate; deception is, therefore, put before cover, because it renders observation difficult, whilst artificial cover usually renders it easy. For this reason better results are often obtained at guns when under cover than when in the open. Speaking of this, General Brialmont says:—

"Wherever they may be placed, epaulments should be concealed by natural or artificial cover. The first day at the battle of Noisseville; Bazaine placed behind earthworks the guns near the road leading from Fort St. Julien towards St. Barbe. These had to be promptly withdrawn after heavy loss, whilst three batteries on the same heights without any protection were enabled to continue in action for some time." Again, Hoffbauer, speaking of Gravelotte, says: "The earthworks that the French threw up to cover their batteries on the heights of Montigny la Grange and la Folie were very conspicuous, and rendered easy the ranging of the German guns."

For a similar reason, in taking up a position behind a hedge, it appears best for the guns to be some distance back, and let them fire over it, the hedge acting simply as a screen. It may even be necessary to cut down part of the hedge to see through, or, as was the case of two batteries of the Guard Corps Artillery at Sedan, to prevent their own shells bursting in the trees.

A modification of the ripple parapet has been tried, and it certainly makes it very hard to range. It is quite different to the ripple parapet tried at Lydd a few years back; then the ripples were close together, and were designed to act as a protection rather than as a mask. As a protection it was not a success, but as a mask, the ripples being small and some distance apart, it appeared successful. It would be almost impossible to range accurately at guns firing smokeless powder from behind such a screen. Probably one would be forced to distribute in depth, *i.e.*, range on the front ripple and then sweep the ground in rear backwards and forwards for a depth of 500 or 600 yards, in the chance of finding the target—a method very liable to lead to a large expenditure of ammunition for a small effect.

Any screen, however, should be such that it does not prevent the full effect of fire from being obtained. Now, if the screen is a hill or embankment, this will not be the case; not on account of any technical difficulty of carrying out the fire, for it is perfectly easy to keep up quite as accurate and rapid a fire as with direct laying (provided, of course, that the ground allows the battery commander to observe effect and command his battery), but because it so cramps the power of the commanding officer to change the direction of the fire, and so practically does away with his power of rapid concentration. The Germans have lately adopted an instrument (the lining plane) for use when firing from such a position, and I must own that the opinion abroad seems inclined that way; but I cannot help thinking that it is only the usual peace tendency to turn to artificial shooting, brought about partly by the unreal conditions of the practice ground, which renders such shooting so easy, and partly to the desire to avoid the large losses expected from improved weapons.

Undoubtedly, on special occasions such firing may be advantageous; but they are the exception, and not the rule. One that is often advocated is, when the artillery of the defence is the weaker; but even then it would only be for the artillery duel, for once the infantry attack began, the target would be shifting, and the guns must be run up to meet it.

As previously stated, the effect of fire at *long* ranges depends on good observation. This is due to the fact that, as the range increases the depth of ground covered by the bullets of time shrapnel decreases, and therefore there is less margin of error in range and position of burst. At what range, therefore, should one open fire? Infantry Drill says:—"The extreme range of useful field artillery fire may be said to be 3,000 yards. Artillery officers claim effective action for their guns at much greater ranges. But it is not necessary for infantry to practise formations intended to lessen the effect of artillery fire at longer ranges than those at which objects can be clearly seen, for the distance at which the effect of fire can be observed practically fixes the extreme range of useful artillery fire." The whole pith of this depends on the last few words. Similarly, F.A.D., although allowing an extra 500 yards, says:—"Advantage should, of course, be taken of the range of the guns to annoy troops passing over a bridge or obligatory point of passage at longer distances up to the power of vision."

A very good example of this is given by Prince Kraft:—"At one moment something was seen moving to the right in the forest of the Ardennes. By the help of field glasses this was made out to be some cavalry marching in two ranks towards the north, and passing through a clearing in the forest on the hill. The batteries endeavoured to find the range. With elevation for a little more than 4,000 paces we appeared to hit. I considered that the range was too great for the fire to have any effect, and I was about to order it to cease, when an evident disturbance in the ranks of the enemy proved that our projectiles had reached him. We continued then to fire slowly at this moving target so long as it



remained visible. . . . On the following day, Lieutenant von Kass, while doing duty as aide-de-camp, passed by this point, and found on a narrow crest, which ran between very steep ravines, an entire French battery, which had been abandoned there. The team of the leading gun had been blown to pieces by our shells, and the other guns could not pass it; thus the whole battery fell into our hands, a trophy of the accuracy of our fire." This also brings to notice an aid to ranging, namely, the visible effect on the target, that is generally absent from peace practice, whilst on service it is most likely to be noticed and taken into account just when it is most required, *i.e.*, at long ranges, since on such occasions it is probable the firing battery will be undisturbed by the enemy's fire. Such appears to have been the case on the occasion quoted, for a few lines before it is stated "that the enemy's artillery and cavalry had been driven off, and then fire was turned sometimes on one point, sometimes on another, against such of the enemy as still showed themselves."

The following results show clearly the effect of the visibility of the target due to ground and background. In 1893, one of the series fired was at a 6-gun battery in action on the slopes of Yes Torr, the range about 3,300 yards, and the ammunition twenty-four rounds. The average results of all the batteries practising was 21·6 hits on 10·8 dummies. In 1894, the above target was advanced to Blackdown Neck, thus reducing the range to about 2,000 yards; the ammunition limit was the same, and the average results were 17·6 on 8·3. The guns in the first case were on ground sloping gently to the front, and appeared as so many black dots. With the naked eye they were generally hard to distinguish, but with glasses or telescopic sight were fairly visible. In the second case the guns were placed on the reverse slope of a very gentle crest, and were very difficult to distinguish even with glasses, although it was perfectly easy to see the position of the firing battery over the sight of every gun in the target battery. The colouring of the background was very much the same as before, but being across a valley, probably 800 yards off, the guns did not stand out at all. In examining the individual results of batteries it appears that at the long range they were all much the same, while at the short they were very uneven, thus showing that the decreased range led when the range was accurately found to increased effect; but on a large average the difficulty of finding the shorter range more than balanced the increased power of the shell. In other words, we may expect to suffer fewer losses by taking up a well-chosen position at 2,000 yards than in an exposed one at 3,000 yards. The effect of the colour of the target is shown by the following experiment carried out in India:—Four batteries fired at two targets, one of 45 standing and the other of 45 kneeling dummies. The conditions were the same, except that on one occasion the colour of the dummies was white, and on the other karkhi. On each occasion better results were obtained at the white, the average hits of the eight white series being 68 per cent. better than those of the karkhi.

*Infantry Column.*—The effects on columns, owing to the depth of target, are almost invariably good, even when the front is quite narrow



(such as a column of fours). When one has both depth and front the results are greatly increased.

In India the conditions for the first series of the competitive in 1893-94 were:—Range unknown, but between 2,200 and 2,600 yards. Ammunition unlimited, time 6 minutes. Target, three columns of fours, thirty dummies in each, and 25 yards interval between the columns.

The average result of all the batteries (41) was 665 hits and 37 shell fired. The best was 2,010 hits and 45 shell, *i.e.*, 335 hits per minute, or 44 per round.

It is, however, only fair to say that the Indian dummies are 6 feet by 2 feet, and that the targets are sure to have been very distinct; for when a competition takes place between different stations it is only human nature that each camp should place their targets in the most favourable position for effect. Even making allowance for this, the result is striking, and a few years back would not have been possible.

*Infantry Line.*—A comparison of the vulnerability of standing and kneeling dummies in a single line is given by the average results of the second and third series of the competitive. The conditions for the second series were:—Target, 45 standing dummies in single line, at one pace interval, range unknown, but between 1,800 and 2,300 yards; ammunition, twenty-four rounds. For the third series the conditions were the same, except that the dummies were kneeling, and the range between 1,400 and 1,800 yards.

At the standing dummies the average was 106 hits on 31·4 dummies, whilst at the kneeling it was 94 on 31. Thus it appears as though the reduction of the range by 500 yards about compensated for the smaller target. This example, however, does not by any means show the full gain, for it is more, on account of the greater depth covered by each shell that increased effects are obtained as the range decreases. In this respect, the present guns and ammunition are far ahead of the old. The report on artillery experiments at Okehampton in 1875 says:—"Fire directed against the first or attacking line produced virtually no effect against the supports or main body. The distances were such as to render the ricochet of fragments harmless, and, therefore, if the fire were directed against the attacking line alone, the general advance of the main body would not be impeded." The experiments on which this opinion was based were carried out by 9 and 16-pounder batteries at ranges from 2,100 to 1,000 yards; the distance from the front line to the supports was 210 yards, and supports to reserve 300. Last year a somewhat similar target was fired at. It consisted of three lines—first, 90 kneeling dummies; second, 70 standing; third, 24 hessians (6 by 6 foot canvas screens). The distance between the first and second lines was 200 yards, and between second and third nearly 300. Range to front line, 1,000 yards. The battery fired fifty-six rounds, all at the front line, in 9 minutes 40 seconds. The effects were—first line, 327 on 84; second line, 82 on 44; third, 22 on 13. The results on the second and third lines were all fairly due to the depth of the shrapnel and not to exceptional rounds, because in the whole series no time and only two percussion shell burst beyond the first line.

This experiment seems to show that at short ranges (1,500 and under) fire directed on the front line will be effective on the supports and reserve.

The question therefore arises, What advantage is gained by dividing the attacking line into firing line, supports, and reserves? Any material increase of distance of the supports and reserves with a view to escape the effect of the fire directed on the firing line would render the object of having supports nugatory, for they would not be available as reinforcements at the moment they were required.

Last year two interesting lectures were delivered here on the attack. In one, great stress was laid on a formation to give as little loss as possible, and percentages were given to show that, theoretically, men dispersed at 8 yards interval, and in rows 9 yards distant, would suffer less loss than the same men in line. In the other the chief stress was laid on facility of control.

The results of artillery practice appear to be all in favour of the latter. In any attack, losses are bound to occur, and, as far as artillery effects are concerned, will be much the same whether the men are in one, two, or three lines, since the distance between lines cannot be sufficient to prevent shell aimed at the front line taking effect on the second and third. The best formation, therefore, is that which gives most control, and consequently greater fire effect, on the principle that the best protection from the enemy's fire is in our own.

Even against rifle fire the same argument holds good, for men, as a rule, fire high, and consequently the front line is often safer than the support or reserve. This seems far borne out by results, for, in the April, 1894, number of the R.U.S.I. JOURNAL, in the notice of Hoenig's account of the attack of the 38th Brigade, it is stated:—"It appears that the companies that advanced in two-deep line formation maintained their cohesion and fire control longest and best; and, turning to the casualty returns, we find that their losses were fractionally lower also."

Major Macartney, in an article in the *United Service Magazine*, of October, 1894 says:—"It seems absurd, considering the far-reaching power of the weapons in the hands of infantry, to hold back a fraction of men 150 to 200 yards in rear of the fighting line. They are equally safe, and can use their rifles in the front itself, but in rear they only add to the depth of the formation and increase the danger. Of the 113 hits made on the 134 dummies at 1,400 yards in an experiment at Hythe, no less than 77 were on the supports. Why not abolish them, by at once placing them in the firing line and keep the reserves as far out of harm's way as is consistent with its being able to afford support?"

Abroad, the opinion seems to be in the same direction, and the support is, in many cases, merged in the firing line from the commencement. The fact that in an attack of infantry on artillery, the target for the latter is a moving one, should not materially affect the results, as the pace is so very slow. In any case, what gain there is would be in favour of the single line. As to the losses to artillery, from long-range rifle fire, it is very hard to know what to expect; experiences are so meagre and

the results vary so greatly. At the field firing at Okehampton no long range (over 1,000 yards) firing has taken place these last three years. At Glenbeigh, one company fired at a battery with the following results:—

The strength of the party firing consisted of one officer, three section commanders, and forty-four rank and file. The target consisted of a battery of six guns in action, with three wagons, and forty dummies to represent detachments. In the first series the range was 2,515 yards; the time occupied was 17 minutes 50 seconds; the number of rounds fired was 459; the effect was *nil*. The second series was at the same target at 1,707 yards, time 13 minutes; 463 rounds were fired; the effect on the target was two hits on two men. The third series was at the same target, range 1,730 yards. This was not fired against time; the rounds fired were 439; the effect was *nil*. In the fourth series the target was an infantry column, 95 dummies; 1,750 yards range; no time limit, the rounds fired were 440; there were thirty hits on thirty men. In the fifth series the target was a battery in action of four guns, twenty-seven dummies in the detachments; range 1,150 yards; time 15 minutes, 489 rounds; the effect was two hits on two men. In all the series the ranges had been taken before firing commenced. Thus, omitting the 2,515 series, 1,830 rounds were fired during the four series, and there was practically no effect at all, except at the infantry target. This is, of course, an isolated experiment, and tells little.

In the accounts of the 1870 and 1877 wars one sees many cases of effective long-range firing, but most of them have been the results of almost unaimed fire at large masses and not aimed fire at such a target as a battery represents.

At the field firing in India the results are generally poor, notwithstanding that in the majority of cases there has been a rehearsal over the same ground with blank, so that the ranges were not unknown.

It would be interesting, especially to artillery officers, if a large number of practices, such as those at Glenbeigh, could be carried out, so that some idea of the effect of long-range fire on a battery, under peace conditions, might be obtained. At those camps where it could be combined with artillery it would also afford information as to the value of artillery passing their elevation to infantry. In the report of the field firing in India, in 1893, it is mentioned that this was done on one occasion apparently with success. The range, however, was only 1,000 yards.

Exception may be taken that peace results are no true criterion of effects on service, and with this I most thoroughly agree. Still, I think it may be granted that if effects cannot be obtained under peace conditions, they will not be obtained on service.

General the Hon. A. Harding, in a lecture "On the Results of Field Firing in India, with a view to their Tactical Application," delivered here in 1879, five years after field firing was started, emphasises this, and says:—"But I would observe that if the indispensable knowledge of our weapon is to be limited to the crucial test of war, not only will that knowledge be very limited, but that it will also be, in some cases, very unreliable. I know nothing more capricious than episodes of war."

# RESULTS.

CAMP.	No. of series from which average is taken.	Average time in action.	Range.	No. of rounds.	Effects		Hits per shell.	Men hit per shell.	Percentage of target destroyed per minute.	Target.	REMARKS.
					Hits	Men					
ARTILLERY IN THE OPEN.											
Okehampton	78	11'52"	2700	24	20	8·5	·83	·30	1·42	{ 6 gun battery and 38 standing dummies. " " " "	On Yes Toor " Blackdown Neck
"	12	10'30"	3285	"	21·6	10·16	·9	·42	2·14		
"	14	11'21"	2085	"	17·6	8·3	·73	·35	1·74		
COLUMN OF FOURS.											
"	12	6'30"	2410	13·9	79	23·25	5·68	1·67	7·15	{ 50 standing dummies in column of fours.	
"	12	6'	1780	12·9	216	36·6	16·75	2·63	12·2		
STANDING DUMMIES IN LINE.											
"	27	8'25"	2000	24	77	29·8	3·2	1·24	4·47	{ 80 dummies in 4 groups, 25 yards between groups, 1 pace between dummies. 81 standing dummies in line, at 1 pace interval. 45 standing dummies in line, at 1 pace interval.	Easy to see. { Just coming over a brow and very hard to make out.
"	14	7'20"	1950	13·6	37·2	16·7	2·73	1·22	2·81		
All home bat-	45	7'30"	2000	23	106	31·4	4·6	1·36	9·3		
teries ..											
KNEELING DUMMIES IN LINE.											
"	45	7'30"	1560	24	94	31	3·91	1·3	9·1	{ 45 kneeling dummies, in line, at 1 pace interval. 81 kneeling dummies in line, at 1 pace interval.	
Okehampton	28	6'11"	1075	17·8	53·2	29·3	3	1·64	5·87		

Battery Station.	Year.	No. of series.	Average time in action.	Range.	No. of rounds.	Effect.		Hits per shell.	Men hit per shell.	Percentage of targets destroyed per minute in action.	Target.	Remarks.
						Hits.	Men.					

# ARTILLERY IN THE OPEN.

Okehampton..	1892	13	12	2960	25	36.4	9.8	1.456	.392	2.358	6 guns, 3 wagons, and 36 standing dummies.	On Bluff.
"	"	15	13 30	3320	25	14.46	8.3	.578	.332	1.707	"	Yes Tor.
"	1893	12	11 18	2845	24	19.8	9	.825	.373	2	6 guns, 3 wagons, and 40 standing dummies.	On Bluff.
"	"	12	10 30	2885	24	21.6	10.16	.9	.423	2.41	"	Yes Tor.
"	Average of	52	11 49.5	(2845 to 3320)	24.5	22.9	9	.93	.37	2	"	

# KNEELING DUMMIES IN LINE.

"	1892	39	6 42	1300	20.7	53.5	28.9	2.58	1.39	3.32	{ 15 standing, 15 kneeling.	{ In one series in 1893 the supports were kneeling.
"	1893	36	7 10	700	21	108.3	41.58	5.16	1.98	4.46	{ 15 standing, 100 kneeling.	

# STANDING DUMMIES IN LINE.

"	1892	15	8 20	2000	24.75	100.5	34	4.06	1.37	5.12	80 dummies in 4 groups, 25 yards between groups, 1 pace between dummies.	
"	1893	12	8 30	2000	23.7	54.1	25.6	2.28	1.08	3.76	"	

Battery Station.	Year.	No. of series.	Average time in action.	Range.	No. of rounds.	Effect.		Hits per shell.	Men hit per shell.	Percentage targets destroyed per minute in action.	Target.	Remarks.
						Hits.	Men.					

# COLUMN OF FOURS.

Okehampton..	1892	15	6 24	2470	13	98-1	26	7-39	2	8-12	50 standing dummies.	
"	1893	12	6 30	2410	13-9	79	23-25	5-68	1-67	7-15	"	
"	"	12	6	1780	12-9	216	36-6	16-75	2-83	12-2	"	
"	1892	11 6-gun	—	3000	25-5	53-1	26	2-03	1-02	—	45	
"	1893	15	{ 6-gun, 6 38 4-gun, 7 30 }	2500	20-4	108-07	29	5-29	1-42	—	"	
Glenbeigh ..	1892	3 6-gun	—	3000	25-3	—	27-5	—	1-08	—	"	
"	1893	8	—	2500	21	113-87	29-75	5-42	1-41	—	"	

# AVERAGE RESULTS OF BATTERY SERVICE.

Okehampton..	1889	—	17 0	2231	20-5	63-4	17	3-1	-331	2-17	46 dummies.	{ Including com- petitive. Do., do., and under cover. Including com- petitive.
"	1890	—	12 11	2325	20-91	43-7	17-7	2-03	-806	2-98	49	
"	1891	—	11 57	2331	25-79	48	18	1-5	-697	3-43	43-67	
"	1892	—	8 3	2285	20-97	48-2	19	2-3	-91	3-65	61-2	
"	1893	—	7 58	1938	21-17	89-24	29-22	4-24	1-38	5-07	72-5	
"	1894	—	8 43	1912	22-35	42-04	17-22	1-57	0-76	3-83	52-28	

# Q. F. GUNS.

	KRUPP.	HOTCHKISS.	MAXIM NORDENFELDT.	SCHNEIDER.
GUN	Calibre .. .. Length .. .. Twist of Rifling .. Weight .. .. Muzzle Velocity ..	2.36 in. 90.55 in. Increasing to 1 in. 25. 5 cwt., 3 qrs., 14 lbs. 1640 f.s.	3 in. 88 in. 1 in. 25. 6 cwt. 1575 f.s.	2.95 in. 98 in. 7 cwt. 1900 f.s.
CARRIAGE	Traversing Gear .. Brakes .. .. Weight .. .. Height of Axis of of Gun .. .. Height of Wheels .. Track .. ..	<i>nil.</i> Spade on trail. 10 cwt., 2 qrs., 14 lbs. 3 ft. 5 in. 4 ft. 4 ft. 10 in.	(Sleeve somewhat similar to that formerly on M. II. 12 pr. Buffington and spade. 12 cwt., 2 qrs., 19 lbs. 3 ft. 9 in. 4 ft. 8 in. 5 ft.	<i>nil.</i> Shoes and spade. 12 cwt. 24 lbs. 2 ft. 5 in. 4 ft. 11 in. 3 ft. 11 in.
AMMUNITION	Weight of Shell .. Weight of Charge .. Weight of Case .. Round complete..	13 lbs. 1.75 lbs. .825 lb. 15.8 lb.	12½ lbs. 12½ ozs. 1 lb. 10 ozs. 14 lbs. 15 ozs.	14 lbs. 5 ozs. 2 lbs. 1 oz. 3 lbs. 6 ozs. 19 lbs. 13 ozs.
LIMBER	Rounds carried .. Total Weight .. behind Team ..	48 31 cwt., 2 qrs., 19 lbs.	36 31 cwt.	36 33 cwt. 12 lbs.



Colonel G. H. MARSHALL, R.A. : It must be very satisfactory, I think, to all to know that the efforts which have been made have proved successful in the introduction of a simple and efficient equipment. I think that we must continue to strive for simplicity, and I think that we must keep that in view if we are to introduce quick firing. Unless we have simplicity in our ammunition and equipment, I do not believe that we shall be able to maintain an efficient and rapid fire, even with quick loaders. I am not sure whether I quite understood the lecturer on this particular point. Perhaps he would tell us whether he considers that a quick-firing gun must necessarily be a complicated weapon. Then, as to the records of effect of fire, I think that these are very instructive, and are most useful for many reasons ; but I would like it to be quite understood, that at Okehampton the system of practice and the scheme for practice are framed entirely with a view to training batteries for efficiency on service, and not in any way for the sake of getting a good record. I sometimes think that the staff we send there are too exacting, but, at all events, the fault is on the right side, and, I believe, all commanders appreciate the advantage of the staff being hard to please. It would be very easy to arrange things so as to get good records and good averages ; you could easily do it by giving unlimited time, by placing the dummies in good positions for observation, and so on. The perfection of training of batteries for efficiency on service would, I think, be arrived at, if, except at artillery targets, you could fire at nothing but moving targets. The ground, for several reasons, at Okehampton prevents that being carried out entirely, but, of late years, we have been advancing in that direction, and I hope we shall make very much more progress in the future in that respect.

Colonel GUNTER : I had not the advantage of reading the lecture before I came here this afternoon, so that I am not prepared with any extensive criticism with reference to it. I suppose, as an infantry soldier, I ought to feel quite wiped out by the appalling fire of the artillery, described by the lecturer. But you, Sir, have been many years in India. You remember, therefore, the Indian story, no doubt, where the tiger and the man were great friends, and the man took the tiger round his village, and on the village walls he showed him a great many pictures of combats between the animals and man, and he said, "You see here in every case the man is victorious." "Yes," said the tiger, "but that was painted by a man." Now, we of the infantry force thoroughly appreciate the improvements in artillery, and we tremble at the results at long distances, but in order to preserve that cordial co-operation between the two arms of the Service which has always characterised the artillery and infantry in the Service, I think they ought to allow us to fire at them sometimes under favourable conditions. The lecturer has said that no experiments have been made with infantry attacking artillery, which is very much to be regretted. Under those circumstances I hope, Sir, you, in your position, will urge upon the authorities the necessity of having really important practice of infantry advancing against artillery under modern favourable conditions. In the experiments against infantry I notice the infantry appear to be almost always placed at one pace apart. Now, I think that infantry moving forward to attack artillery would no longer move forward in what used to be the attack formation, but would be considerably more than one pace apart, if they wished for success, and I believe myself that there would be no longer those depths of line, supports, and reserves following one another, upon which the artillery are able to fire with such good effect. The lecturer has noticed that the second echelon, as it is called, has been absorbed into the first. You, Sir, are, doubtless, quite aware, and most people here are aware, that this has actually been carried to a regulation in the publication of the new French infantry of 1894. The second echelon, the support, has been done away with. They are extended from the first into the firing line, by which they get a greater length of enveloping fire and avoid the losses that must be felt by the supports being within the range of the shrapnel. The reserves are kept further back in order to avoid the

effect of fire. This is, of course, a large question, which, no doubt, will be fully considered by our authorities. Of course, as the lecturer has pointed out, although it is always well to keep the supports and reserves away from the fire, it is of no use whatever if the reinforcements are not there when they are wanted. They must, therefore, not be too far back, and we have to consider whether the support line is still necessary for the moral effect it has on service. Perhaps artillery officers might not take the results here as results to be obtained upon well-trained infantry under modern conditions, for I think if the infantry were carefully extended and led, notwithstanding the improvements in artillery, the results obtained would not be nearly so good as those represented by the experiments before us.

Colonel R. MacG. STEWART, C.B., A.D.C. : I had not intended to make any remarks, but I should like to ask the lecturer about one point here, in which he contrasts the effect of howitzer fire with that of 12-pounder fire, with reference to the amount of ammunition. It is in the example given of "a parapet fired at by the 6-inch howitzer. It had a command of 11 feet over the bottom of the trench," and so on. I do not think it is so much the amount of ammunition that would be required, but I do not quite know how you could get at this underground trench with the 12-pounder; you might fire 500 rounds and never go near it. As far as I remember the experiment, the angle of the trench was too great; I do not know how far you would have to go back to get into the trench. I think the attempt to contrast the two together is possibly misleading, because the conditions are absolutely totally different. In that case, as well as I remember, a howitzer with tolerably high-angle fire was the only weapon that possibly could get at the target, and I doubt very much if you could have had any hits at all with the 12-pounder under ordinary circumstances, I think, as Colonel Marshall has said, we may congratulate ourselves very much indeed that we are arriving at a system in which simplicity and mobility are looked upon as two great facts, but in getting that simplicity I hope it will be recognised that what is left to us to fight with shall be absolutely and under all conditions suited to the requirements of the fight, that is, that the one shell left to us, whether it be used as a time shell or whether as a percussion shell, shall be effective at all ranges, thoroughly effective and thoroughly to be depended upon. By that means alone can that confidence be given to soldiers and gunners in the weapon with which they have to fight that will enable them to act comparably and steadily under all circumstances. The Maxim-Nordenfeldt gun, as the lecturer has shown, has, I think he says, a seat on the trail, not on the axle tree. [Major HUGHES : It is shown on the diagram.] I hope sincerely we shall shortly be provided with howitzer batteries which will supplement the excellent batteries that are being equipped for us as field artillery, because I doubt if any general commanding a *corps d'armée* in the field having to attack an enemy in a very strongly entrenched position would like to be obliged to rely upon field guns only. I think he would like to have something in the shape of high-angle fire to help him before he developed his attack with infantry. The lecture is most interesting, bringing us up to date in artillery matter, showing what we have at present and what we may expect for the next year or so. I am sure at Shoeburyness we had every wish to obtain practical test with infantry fire against artillery targets. The lecturer has referred to an experiment made by a company of infantry firing at a battery, and states that the experiment was an "isolated one and tells little." We all admit it "tells little," because we had not had, as far as I know, any real practical experiment of the effect of infantry fire against an artillery target. I think the lecturer was endeavouring to show how difficult the artillery target was very often, as compared with other formations we have to fire at, and I would also point out this, that the average of competitive practice gives very little idea of the effect of artillery fire against a moving target of infantry such as we should have on service. They are the best targets they can give us, but they are merely guides. I do not think any of us will for a moment persuade ourselves that the effect on

service will be so great as the effect we get in competitive practice. As Colonel Marshall remarked, our efforts in the future must be how on all occasions to get moving targets, but it is a very difficult matter to deal with. If anybody can show us how to get good moving targets which will represent bodies of infantry and cavalry, we shall be very much obliged. At present we are limited by ammunition, and we are limited by such targets as we have got. If we can get these moving targets I can only say no one will be more pleased than the artillery, and it will conduce, I am sure, to increased efficiency in our practice and the knowledge of our art.

Colonel GUNTER: May I ask if, in the experiments referred to, the infantry were represented as making a frontal attack only, or whether some were attacking in flank also? as that would make a difference.

Colonel STEWART: I believe the attack was a direct one.

The CHAIRMAN (General Chapman): I think my own remarks have been practically made by Colonel Stewart and Colonel Marshall. I have nothing to say from the artillery point of view, except that I think we ought to recognise how very distinct the progress in artillery practice has been. Not only in the last two or three years, but going back from five to ten years we can recollect how very poor the artillery hitting was compared with what it is to-day. I regret that the lecture has to some extent not brought out a comparison between what was the state of things some few years back and what we have now. With regard to the point that Colonel Gunter brought out about infantry supports, it is quite true last year in the French manoeuvres the French tried a new regulation for infantry attack, but I do not think they proved that it is the right thing. For myself, I believe that an infantry man who is supporting a line, whether he is in reserve or at any distance from the line, has the greatest difficulty in saying where he will be at a given time. He will, I think, have to act with great independence, and he will have to judge for himself whether he will go up into the firing line or whether he will take advantage of the ground and be near his firing line or be distant from it. What he has to keep in view always is to keep supporting if he is to give aid to the firing line; and it is a very difficult thing to do indeed, because the man is always considering and thinking how far off he is and whether he is the right distance from the firing line or not. I think he ought to take advantage of every accident of the ground, and there are many accidents of the ground, and he should be as near and always ready to support as possible. No doubt the French will make further experiments, and we shall watch them very closely this year; but it is still a matter of doubt, and will always be till we actually go to war, as to what to do with the infantry in the attack. The Germans are our great models, and they recognise that they cannot lay down a regulation too strictly. The other point was about the quick-firing guns. I cannot myself see that quick-firing guns proper are likely to be used in field artillery, and I am very anxious that we should not make a mistake in confusing the two. I think we shall arrive at guns that fire quickly, but not like the common quick-firing gun as it is known in the Navy at the present day. Then, with regard to high explosives, I am not inclined to think that they will be largely used in field artillery, unless indeed something more violent than the existing compounds can be devised. They may, of course, be extremely useful on certain occasions, and no doubt, with this view, most European nations carry one or two wagons of high explosives. I have nothing more to say, and will ask Major Hughes to answer the few questions that have been put to him.

Major HUGHES: With reference to what Colonel Marshall said about simplicity, I certainly should have added that to the requirements of quick firing. As to the present quick firers, they appear to me rather complicated. At the same time, I must say I myself have not had sufficient experience of them to be able to give a definite opinion. With regard to what Colonel Gunter said, I am very glad that he agrees with me that experiments are wanted, because, after all, that really is the chief reason that brought about the experiment at Glenbeigh. It was not

really with the idea of saying that that was what could be done, but more in the hope that one might, perhaps, at some other time have longer experiments, so that one might compare them. With reference to Colonel Stewart's remark as to the howitzer, certainly I do not think that the 12-pounder would have done anything; the only thing it would have done would have been to keep the men underneath the parapet; they could not have fired over it. I have only, in conclusion, to thank you for the kind way in which you have received my paper.

The CHAIRMAN: I have now only to ask you to give a hearty vote of thanks to Major Hughes for the lecture he has given us. It has been very useful and very instructive.

## A FEW PRACTICAL HINTS ON THE WORKING AND USE OF MAXIM GUNS.

*By Captain Hon. A. LAMBART, R.A.*

**A**S there are now in the British Service a considerable number of the Maxim automatic rifle calibre machine-guns, it is thought that a few general remarks on points which require attention to ensure their satisfactory working may prove of interest to officers who are brought into contact with these valuable weapons, possibly for the first time.

Before proceeding further, it should be stated that all remarks now made are merely intended to supplement and emphasise—not to supersede—what is already stated in the official handbooks, to which reference should be made for descriptions of mechanism, action, etc. As an exception to the foregoing, it should be mentioned that the limits of weight to be given to the fusee spring are not accurately given on page 7; they will be found fully specified later on in these notes.

The first point on which to lay stress is the necessity for having this gun in the hands of trained detachments who are familiar with and understand its working; their experience enables them to know exactly what weight of fusee spring (within the limits) suits the gun best, what is the effect of rapid fire on the elevation required, also what are the minor stoppages which may occur, and how to remedy them. Now, to attain this familiarity it is necessary that these detachments should have frequent practice, but there are many stations where it would be very inconvenient, if not impossible, to carry this out; accordingly, to meet this difficulty, a muzzle attachment has been introduced which, when fitted to the gun, enables the latter to fire blank cartridges automatically in exactly the same way and giving the same recoil as when ball cartridges are used; further, no change is made in the mechanism or feed, so that it is now possible to efficiently train men in the practical working and use of the gun with but a comparatively small outlay for ammunition. This blank firing arrangement has been introduced into the Service for use with guns of 0.45-inch calibre, both with M.H. and G.G. chambers; but for guns of 0.303-inch calibre the blank ammunition has not been found suitable, and so the attachments have been temporarily withdrawn.

As the instructions for the use of the blank firing attachment are not given in the handbook, it may not be out of place to briefly specify them here:—

- (1) See that the barrel is clear.
- (2) Remove muzzle protector from barrel and packing gland from front of gun.
- (3) Screw on gun metal gland, taking care not to jam the barrel. This can be tested by removing the fusee spring box, and then seeing that the barrel will work freely backwards and forwards with a pressure not exceeding 7 lbs. with gun horizontal.

- (4) Screw cup muzzle tightly on to muzzle of barrel.
- (5) See that the adjusting screw is screwed right home in the outer casing, that is, at its extreme distance from the cup muzzle, then screw the outer casing on to the gun metal gland.
- (6) If there is not sufficient recoil to work the gun, screw in the adjusting screw a little nearer to the barrel, taking care it is not turned in too far, so as to come in contact with the cup muzzle.
- (7) When it is correctly regulated lock the adjusting screw with the check nut.
- (8) The fusee spring should be at just the same weight as when firing ball, the adjusting screw being depended on solely for controlling the recoil. In exceptional cases it may be found necessary to alter the spring slightly, but on no account should the limits laid down for this spring be exceeded.

When firing a gun with blank for the first time, or when firing a fresh description of blank ammunition, practice should always be commenced with the adjusting in the extreme forward position, otherwise an unexpectedly violent recoil may be produced and the gun thereby strained.

A few general hints are now given in connection with the actual working of the gun :—

- (1) Always keep the safety catch down, except when the gun is actually being fired. When firing ceases, the safety catch should be, in every instance, immediately turned down.
- (2) Before commencing to fire, make sure that the barrel casing is filled with water, and the barrel itself is clear.
- (3) Always test the fusee spring before going into action. The weight for a gun of 0.303-inch calibre must not exceed 7 lbs. or be less than 6 lbs., and for guns of 0.45-inch calibre must be between the limits 12 lbs. and 14 lbs. To test the weight work the crank handle backwards and forwards, and ascertain that the lock runs quite free, having first removed any cartridges or empty cases from the extractor; then, when the crank handle is home to its position on the check lever, place the loop of spring balance over the knob of crank handle, pull the balance *vertically* upwards, and note the number of pounds indicated when the handle *commences* to move up. The pressure thus obtained is the correct measure of the weight of the fusee spring.

It is a great point to get familiar with the gun one has to use, and to know exactly what weight of spring suits it best. As a general guide, it may be taken that a new gun will work best with a lighter spring than when it has been in use some time and got worn.

- (4) Never fail to have a plentiful supply of oil. Not only should the receptacles in the handles be always kept full, but also, if possible, it will be found most useful to have a small oil-can handy wherever the gun is. Before taking a gun into action, always see that the following parts are well oiled, viz. :—

- (a) Bearing parts of barrel and all the recoiling portions.
- (b) Lock guides and the working parts of the lock itself, especially the levers and the extractor.

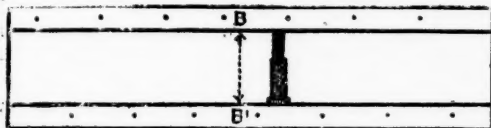
(c) Face of feed block and the edge of the steel guide inside the block.

(d) The bearings of the crank as far as they can be reached without stripping the breech casing.

(5) Whenever a stoppage occurs when firing, and it is desired to ascertain the cause, having first put down the safety catch, allow a second or two to elapse, and then open the cover, and if it is seen that the extractor is not quite up, no attempt should be made to raise it. On the contrary, the extractor should first be pushed down before the crank handle is turned over to the front to draw the lock back. By this means all risk of firing a cartridge accidentally is avoided, as the firing-pin cannot strike against any cartridge in the extractor, except when the latter is at its highest position.

(6) When firing blank ammunition, it will be found to assist the working of the gun, if the belt, on emerging from the left side of the feed block, is allowed to fall down in *front* of the ammunition box, instead of sliding straight down along the lid; in no case should the belt be allowed to fall in rear of the box.

(7) It is most important that the ammunition belts should be correctly and evenly filled. When loading with ball cartridges, absolute regularity is ensured by the use of a belt-filling machine. To fill belts correctly with blank ammunition, the use of a rough wooden gauge is recommended. This could easily be made locally, by taking a smooth



wooden board about 4 feet long, and screwing on to it two wooden strips *B B'* as shown. These strips should be parallel, and the distance between them just the length of a Service ball cartridge. If then the belt is correctly filled, it will evidently lie flat in the channel thus made, and just fit in it; the ends of the brass strips will touch the side piece *B*, and the cartridge heads will lie against the other piece *B'*. It can then be easily seen whether all the cartridges are evenly and correctly inserted.

It may now be useful to enumerate the most common causes which bring about stoppages while firing, and then to point out the simplest way of remedying them. First, it may be observed that a very good idea of what has gone wrong may often be obtained by simply observing the position in which the crank handle is arrested when the stoppage occurs.

(1) *Crank handle, vertical or nearly so.*—Probably the fusee spring is too heavy, preventing the recoiling portion from coming right back; consequently, the extractor cannot drop, and the cartridge just drawn out of the belt is brought forward again, so as to jam against the one just fed up.



To remedy, there is no need to open the cover; simply bring the crank handle forward on to the buffer spring and let it go, then all is ready for firing. If the stoppage is repeated two or three times, lighten the fusee spring, taking care that in no case should its weight be less than 6 lbs. in a gun of 0.303-inch calibre, or 12 lbs. in that of 0.45-inch. If the stoppage is repeated with the spring at minimum weight, the bearing parts should be oiled as described in case 3.

(2) *Crank handle in intermediate position inclined about 45°.*—This shows the lock has not gone fully forward, indicating probably an obstruction in the chamber. Most frequently this is caused by defective ammunition having given what is called a "separation," which means that the cartridge case has given way under the stress of firing and has separated circumferentially, leaving the front portion in the chamber, thereby preventing the next cartridge from getting home and so causing a jam.

To remedy, put down safety catch, open cover, turn crank handle over on to the buffer spring, raise the lock and examine the cartridges in the extractor; it will then very likely be found that the cartridge just drawn out of the barrel has extracted that portion of the burst case which was left in the chamber. If so, all is now clear, the cartridge with the broken case on it can be removed, the lock replaced, the cover shut down, and firing resumed. Should, however, the burst portion remain tightly fixed in the chamber, then the Mark II. clearing plug must be used as described on page 9 of the handbook.

Sometimes in the case of cartridges which have a paper lining, the obstruction is caused by this lining getting blown out and lodging in the chamber; to remove this, open the cover and remove the lock, then open the shutter, and pass through the aperture the cleaning rod with tow on the end. See this fits tightly in the chamber, turn it round a few times and work backwards and forwards till the paper is drawn out.

(3) *Crank handle almost, but not quite, home to its position on the check lever.*—Here the extractor has not quite come up. This may be due to (a) light fusee spring, (b) a fault in the feed, (c) a fault in the lock, or (d) a want of oil on the bearings. To remedy, first remove thumb from firing lever, then, without opening the cover, simply strike the crank handle with the hand to send it home; if this is easily done, and then, on pressing the firing lever, the gun fires a few rounds correctly till the same stoppage recurs, the inference is, that the fusee spring is not strong enough to bring the recoiling portion into position again, consequently, the weight of this spring should be raised, taking care that it is not heavier than 7 lbs. for guns of 0.303-inch calibre, or 14 lbs. for those of 0.45-inch, as previously stated. Now fire the gun again, and if the same difficulty still arises, it shows there is an excess of friction somewhere, due probably to a want of oil on the bearings of the barrel and recoiling portions. To lubricate these quickly without removing the fusee spring-box, turn down the safety catch, open the cover and withdraw the lock, taking care to press down the extractor while doing so; next remove all cartridges from it, then replace the lock, and fix it as follows:—Turn

crank handle on to buffer spring, raise the lock slightly till clear of its guide, allow the handle to come back a little, and the lock to rest on the top of guide ; it will now be found to be fixed in position, so that by working the crank handle a reciprocating motion is given to the recoiling portion. This enables the barrel to be at once oiled at its important bearing points, viz., (*a*) just in front of the gun metal valve (which can be got at by removing the feed block), and (*b*) at the muzzle end in front of the packing gland.

In addition to the barrel, the following parts should be well oiled :—The recoiling frame, the lock, and the guides on which it slides. Now replace the feed block, and lock, and resume firing. Should, however, the gun still fail to work, it shows there is probably something wrong with the lock, which should, therefore, be put aside for special examination by an armourer-sergeant.

If it is found when stoppage in this position occurs that the crank handle cannot be easily sent home by a blow or pressure from the hand, then put down the safety catch, open the cover, and without touching the extractor see if the cartridge in the feed block has been properly fed up ; if not, the belt should be felt in the feed block to see whether it is loose or jammed. If the former, it can probably be adjusted by pulling the belt to the left ; but should it be tightly fixed with the cartridges fed crossways, the lock should be withdrawn, cleared of cases, and fixed as described above. Then, on turning the crank handle to the rear, the top pawls in the feed block are moved to the right, thereby releasing the pressure on the belt, so that the latter can now be pulled into position by hand.

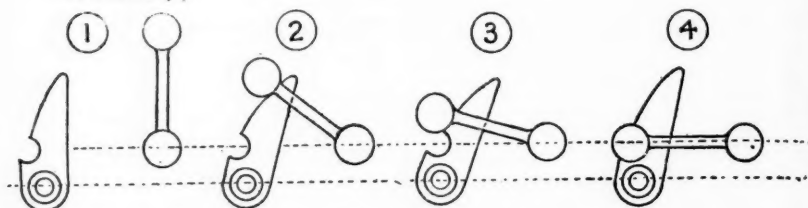
(4) *Crank handle right down in position.*—This shows the lock must be now quite home, so that the stoppage is due either to (*a*) a missfire, (*b*) broken side or extractor levers, or (*c*) a blank cartridge on one with a loose bullet which has dropped out.

To ascertain which of the above has actually taken place, put down the safety catch and open the cover. Then, if it is seen that the extractor is right up, the stoppage is due either to (*a*) or to (*c*), to determine which raise the lock ; if it contains two live cartridges, it is obvious there has been a missfire ; but if there is only one live cartridge and the other has evidently been fired, it shows that the latter must have been either a blank cartridge, or one in which the bullet has worked loose and tumbled out. To get rid of the defective cartridge close the cover, turn the crank handle over to the buffer spring, pull the belt to the left through the feed block, and let go the crank handle ; a fresh cartridge is thus placed in the chamber, and all is now ready for firing.

If, however, on first opening the cover, the extractor is seen to be quite down, it shows that the mechanism for raising it has got fractured ; the lock must, therefore, be removed and replaced by the spare one.

In conclusion, it is hoped that the following diagrammatic sketches of the various positions of the crank handle when stoppages occur may be of use in assisting those concerned to quickly recognise what is

probably the cause of failure, and thereby act as a guide in the suggestion of a remedy.



- (1) Too heavy fusee spring, or want of lubrication.
- (2) Obstruction in chamber due to defective ammunition.
- (3) Either (a) too light fusee spring, (b) want of oil, (c) lock damaged, or (d) fault in feed from irregularly-filled belt.
- (4) Either (a) missfire, (b) broken side or extractor levers, or (c) blank cartridge, or one with a loose bullet.

## NAVAL AND MILITARY NOTES.

### NAVAL.

HOME.—The following are the principal appointments which have been made: Vice-Admiral—Lord W. Kerr to command of Channel Squadron, vice Vice-Admiral R. O. B. Fitzroy. Rear-Admirals—H. H. Rawson, C.B., to command of the Cape of Good Hope station, vice Sir F. G. Bedford, K.C.B.; A. H. Alington to Second-in-Command of Channel Squadron, vice A. Dale. Captains—W. H. St. Clair to "Sanspareil"; B. E. Cochrane and O. Churchill to "Thunderer"; J. E. Meryon to "Katoomba"; G. Le C. Egerton to "St. George"; A. C. Bromley to "Endymion"; A. Barrow to "Royal Sovereign."

The new second class cruisers "Flora" and "Charybdis" are to be commissioned to strengthen the Channel Squadron, and the new torpedo gun-boat "Halcyon" has also been commissioned to take the place of the "Sharpshooter" in the same squadron. The new torpedo-boat destroyer "Ardent" has been commissioned for service on the Mediterranean station.

At Devonport on the 25th ult. two vessels were launched, the second class cruiser "Talbot" and the sloop "Phoenix."

The "Talbot," second class, twin screw, wood-sheathed, protected cruiser, is one of three vessels of the improved "Astræa" type, her two sisters being the "Eclipse" and "Minerva." She was laid down on March 5th, 1894, on No. 3 slip, immediately after the "Harrier" had been launched. She has therefore been about thirteen months under construction, and during that time about 3,580 tons of material have been worked into her. Her principal dimensions are:—Length between perpendiculars, 350 feet; breadth, extreme, 53 feet 6 inches; draught of water, forward, 19 feet 6 inches; aft, 21 feet 6 inches; displacement in tons, 5,600; estimated H.P., 9,600; estimated speed, 19½ knots per hour. Her machinery, which has been made at Keyham Factory, consists of two complete sets of vertical triple-expansion engines with cylinders of 33, 49, and 74 inches diameter, with stroke of 3 feet 3 inches. These are in separate engine-rooms, each capable of developing 4,800-H.P., with 140 revolutions per minute. The "Talbot" has a total coal stowage of 1,076 tons, and there is accommodation for 436 officers and men. She will also be provided with the following armament:—Five 6-inch Q.F. guns, six 4·7-inch ditto, eight 12-pounder Q.F. guns, one 3-pounder Q.F. Hotchkiss, one 12-pounder 8 cwt. Q.F. field gun, four 0·45 Maxim guns, and ten 18-inch Whitehead torpedoes.

The "Phoenix," a twin-screw, sheathed sloop, built of steel, is one of two vessels of the same class, her sister being the "Algerine," also building at Devonport. She was laid down at No. 2 slip on July 26th, 1894, and during the nine months she has been under construction 450 tons of material have been used, and she is in a very forward state. Her dimensions are:—Length between perpendiculars, 185 feet; breadth, extreme, 32 feet 6 inches; draught of water forward, 11 feet; aft, 11 feet 6 inches; displacement in tons, 1,050; estimated H.P., 1,400; speed, with natural draught, 12 knots. Her engines, for which the order was given to Keyham Factory, consist of two complete sets of vertical triple-expansion engines, with cylinders of 13½, 20½, and 31 inches diameter, in separate engine-rooms, each capable of developing 1,400 H.P., with 200 revolutions per minute. Her total coal stowage is 160 tons, and when commissioned she will have a complement of 106 officers and men. Her armament consists of six 4-inch Q.F. guns, four 3-pounder Q.F. Hotchkiss, and three 0·45-inch Maxim guns.

The new sloop "Alert" has successfully completed her eight hours' natural draught trial off Sheerness. The results of the trial were as follows:—Mean pressure of steam, 149·3 lbs.; revolutions, 178 per minute; vacuum, 27·3 inches; air pressure, three-tenths of an inch; I.H.P., 1,156; speed, 13 knots per hour. There was a total absence of hot bearings and priming. The engines were designed to indicate 1,100-H.P., with a speed of 12·25 knots per hour, so that the H.P. is fifty-six in excess of the specifications, with an increased speed of  $\frac{3}{4}$  knot per hour.

Rapid progress continues to be made with the "Magnificent" at Chatham and the "Majestic" at Portsmouth. The whole of the redoubt armour for the "Magnificent" has been received from the contractors, and placed in position. The two turn-tables made in the yard, and weighing about 50 tons each, have been completed, and are being erected on board, so that in a few weeks they will be ready for the reception of the vessel's four 12-inch guns, the trials of which are looked forward to with considerable interest. The official trials of the machinery are expected to take place early in June. The constructors are, however, waiting the delivery of the armoured casemates for the 6-inch guns, two only having been received out of the twelve ordered from the contractors at Sheffield. The "Majestic," which has now some 8,400 tons built into her, is to be ready for her steam and gun trials by the 31st August, and in the same month the "Prince George" is to be launched. It is fully expected that the "Majestic" will be ready for an experimental cruise next January.

Satisfactory progress continues to be made at Chatham on the "Victorious," the plating of which is nearly complete up to the top sides, fore and aft, and the engine contractors, Messrs. Leslie and Co., have commenced to lay the foundation bearers for the machinery and boilers.

The "Illustrious," building at the same yard, is almost completely in frame to the height of her protective deck, while a large number of the beams for this deck, together with several bulk-heads, are fixed in place. Considering that the vessel has been laid down a few weeks only, the progress made is surprising. Every effort is being made to push on the work as expeditiously as possible. The contractors have promised to deliver the sternpost on June 24th, and the rudder about a month later. Both are to be made of cast-steel.

The Admiralty have intimated to the contractors who are constructing the new dock, No. 14, at Portsmouth, that it must be completed in fifteen months' time, and in order to fulfil this order it has been found necessary to put the excavators on night and day shifts. The navy work of the dock is, however, nearing completion, and then the building will have to be taken in hand. So firm is the clay foundation that no piling will be necessary, but over the clay bottom it is proposed to lay 3 feet of concrete, then 9 feet of solid brickwork, and from this will spring the granite masonry. The bulk of the granite blocks are already cut and numbered, and ready to be placed in their proper position. The building operations, therefore, are not expected to be of an unduly protracted character, for by the time the blocks are wanted the majority, if not all of them, will be on the spot, and will require neither cutting nor dressing.

The entrance to No. 14 dock, which is the first to be finished is to be 98 feet wide. It can only be approached by the tidal basin, the docks, and the repairing basin, the openings to all of which are 82 feet. When the extension works were designed an alternative route was planned *viâ* the rigging basin and the repairing basin. The plan of 1876 gives the same width of 82 feet to the caissons of both basins; but even so far back as that time the possibility of enormous ships was contemplated, as the outer caisson of the rigging basin, which opens direct into the harbour, and which is now blocked by mud, was built, after the original plan was approved, to a width of 98 feet; but the caisson between the two basins was laid down at an 82-foot width. It will now cost £30,000 to repair this want of prescience. We have reached a stage when ships are built with a beam of 75 feet.

Add bilge keels, and it will be seen that a dock with an opening of 82 feet only gives a ship a poor chance of getting through with safety, especially if the vessel be 500 feet long and there is a stiff breeze on her quarter. To make No. 14 dock approachable it was necessary either to widen the gates leading thereto, *via* the tidal basin and the locks, or to widen the opening between the two great basins. The latter course has been adopted, but it will also involve months of dredging to make the channel to the entrance of the rigging basin navigable by ships of great draught, while it is doubtful whether the inner caisson can be widened as soon as No. 14 dock is opened.

A satisfactory official coal-consumption trial of 12 hours' duration of the new torpedo-boat destroyer "Ardent," now under orders for the Mediterranean, built and engined by Messrs. J. I. Thornycroft and Co., of Chiswick, took place during her passage from Sheerness to Portsmouth. With an approximate I.H.P. of 473 developed by the engines, the continuous running speed attained was 13 knots, the distance run per ton of coal consumed being 37.93 miles. The coal-consumption trial of the "Ardent" was made against a heavy head sea and strong wind, and during the twelve hours 82 cwt. of coal was consumed, or 1.61 lb. per I.H.P. (developed) per hour.

The first class cruiser "Blake," lately the flag-ship of Vice-Admiral Sir J. Hopkins, on the North American and the West Indian station, has arrived home, and is to be paid off at Chatham.

The Government's Bill for making provision for the construction of sundry naval works has been printed and circulated. It provides for the expenditure during the present financial year of a million sterling, which will be provided out of the Consolidated Funds. It is laid down that the Admiralty shall submit to the Treasury an estimate, with details, of the expenditure on the works proposed to be carried out. It is also provided, "There shall be no excess of any expenditure proposed by the estimate under any head above the amount stated for that head in the schedule, unless the Admiralty previously certify that the excess will be compensated by a saving under some other head, and that the excess will not cause the total expenditure to exceed the total sum specified in the schedule." For the purposes of the Act the Treasury is empowered to borrow money by means of terminable annuities for such periods not exceeding thirty years from the passing of the Act as the Treasury may fix. These annuities will be paid for out of the moneys annually provided by Parliament for naval services, and any excess will be paid out of the Consolidated Fund.

The following is a full statement of the proposed naval works and their estimated cost, together with details of the proposed expenditure during the next financial year of the million sterling which it is intended to raise under the Act referred to above:—

New Works.	Total Estimated Expenditure.		Amount proposed to be expended between the 31st March, 1895, and 1st April, 1896.
	Already sanctioned by Parliament.*	New Proposals.	
(A.) Enclosure and Defence of Harbours against Torpedo Attack :—			
Gibraltar—			
Completion of present Mole ...	£ 63,000	£ —	£ 30,000
Extension of present Mole ...	310,000	—	80,000
Detached Mole ...	—	585,000	75,000
Deepening Harbour ...	—	48,000	10,000
Dolphins ...	—	48,000	—
Portland—			
Breakwater ...	—	650,000	90,000
Dover —			
Breakwater, etc. ...	—	1,920,000	—
	373,000	3,251,000	
(B.) Adapting Naval Ports to present Needs of Fleet :—			
Deepening Harbours and approaches at Portsmouth, Chatham, Devonport, and Haulbowline ...	885,000	—	300,000
Keyham Dockyard Extension ...	1,920,000	—	80,000
Portsmouth Docks ...	239,000	—	150,000
Gibraltar Dock ...	361,000	—	80,000
Hong-kong Dockyard Extension	—	290,000	—
	3,375,000	290,000	
(C.) Naval Barracks, etc. :—			
Chatham Naval Barracks ...	347,000	—	50,000
Portsmouth Naval Barracks ...	—	595,000	—
Walmer Marine Depôt (Extension)	20,000	—	20,000
Keyham Engineers' College (Extension) ...	30,000	—	20,000
	397,000	595,000	
(D.) Superintendence and Miscellaneous Charges ...	121,000	179,000	15,000
	4,266,000	4,315,000	1,000,000
	8,581,000		

\* The figures given in this column are the estimates for these works, after deducting the estimated expenditure up to the end of 1894-95.

Since the publication of the above bill, the Admiralty have decided to spend £10,000 both at Dover and Hong-kong during the present year on the necessary surveys and other essential preliminary work, and we have been informed on good authority that it would not be possible for many months to come to spend more money or begin the actual harbour works themselves.

The following description of the new first class cruisers, for the commencement of which provision is made in the Navy Estimates of 1895-96, has been issued as a Parliamentary paper :—

When the statement of the First Lord explanatory of the Navy Estimates for 1895-96 was presented the designs for the four first class cruisers proposed to be laid down had not been completed; consequently details could not be furnished. Since that date these designs have been completed and approved by the Board.



The principal dimensions are as follows :—Length between perpendiculars, 435 feet ; length on waterline, 455 feet ; beam, 69 feet ; mean draught with keel, 25 feet 3 inches ; displacement (about), 11,000 tons. The armament will include fifteen 6-inch Q.F. guns, fourteen 12-pounder Q.F. guns, and twelve 3-pounder Q.F. guns, besides smaller machine-guns. The torpedo armament will include two submerged tubes and one stern tube. The protective arrangements to engines, boilers, magazines, and other vital portions will be practically identical with those of the "Powerful" and "Terrible." The new cruisers will also resemble the "Powerful" in the protection of the armament and the arrangements for the transport of the ammunition from the magazines to the fighting positions. They will resemble the "Royal Arthur" and "Crescent" in having considerable height of freeboard, with a long forecastle. The steel hulls will be wood-sheathed and coppered, so that the vessels may keep the sea for long periods without serious loss of speed. The measured mile speed, with natural draught, will be about  $20\frac{1}{2}$  knots, which should give, with the type of boiler to be used, a continuous sea speed for smooth water and clean bottom of about 19 knots. Coal-bunker capacity for about 2,000 tons will be provided, half of this being carried at the above-stated draught and displacement.

The Admiralty have now transmitted to the different dockyards the particulars of the new second class cruisers which are to be constructed. Like the "Forte," "Fox," "Flora," "Hermione," and "Charybdis," second class cruisers lately completed in the Royal Dockyards, they are to be 320 feet in length, but, whilst their beam is 49 feet 6 inches, that of the new vessels will be 57 feet. Their draught of water will be 22 feet against 19 feet, and the displacement 5,750 tons as compared with 4,360. The vessels will practically be a new type, as their immediate predecessors, the "Eclipse," "Minerva," and "Talbot," second class cruisers, which are still in the builders' hands—two of them, in fact, having yet to be launched—are 350 feet in height and 53 feet 6 inches in beam, with a mean load draught of 20 feet 6 inches, and a displacement of 5,600 tons. The armament will consist of 6-inch, 4.7-inch, and 12-pounder Q.F. guns, arranged as in other recent second class cruisers. The 6-inch guns will have a fore and aft fire, while the 4.7-inch and 12-pounder guns will be on the broadside.

Orders have been issued for preparations to be made at Sheerness Dockyard for commencing the construction of a new type of third class cruiser. The proposed vessel is to be laid down upon the building slip from which the second class cruiser "Charybdis" was launched in May, 1893, and which has since been vacant. The new vessel, which has not yet received a name, will be the largest third class cruiser in point of length ever built for the Royal Navy, her length between perpendiculars being set down at 300 feet, or the same size as most of the second class cruisers built under the Naval Defence Act. She will have a beam of 36 feet 6 inches, and a displacement of about 2,100 tons. Her machinery, which is to be supplied by contract, is to be capable of indicating 7,000-H.P., and propelling her at a speed of 20 knots per hour. The armament of the proposed vessel is to consist of eight 4-inch and eight 3-pounder Q.F. guns, together with a torpedo equipment. The new vessel is officially described as an improved "Barham," but is larger, faster, and more powerfully armed than that cruiser.

AUSTRIA-HUNGARY.—On the 9th inst., at the Imperial dockyard, Pola, in presence of the Kaiser, many members of the Imperial family, and the principal naval and military authorities of the Empire, the "Monarch," the first of the three new coast-defence ships to take the water, was successfully launched, H.I.H. the Archduchess Maria Theresia performing the christening ceremony. The first keel-plate was laid on the 1st August, 1893, and her two sister-ships, the "Wien" and "Buda-Pest," were commenced somewhat later in the year at the

Stabilimento Tecnico Triestino, the great private shipbuilding yard at San Rocco, near Trieste. The following description of the ship, compiled from official details published by the Ministry of Marine, we have taken from the *Militär-Zeitung* of Vienna, while the plans we have reproduced from the *Mittheilungen aus dem Gebiete des Seewesens*.

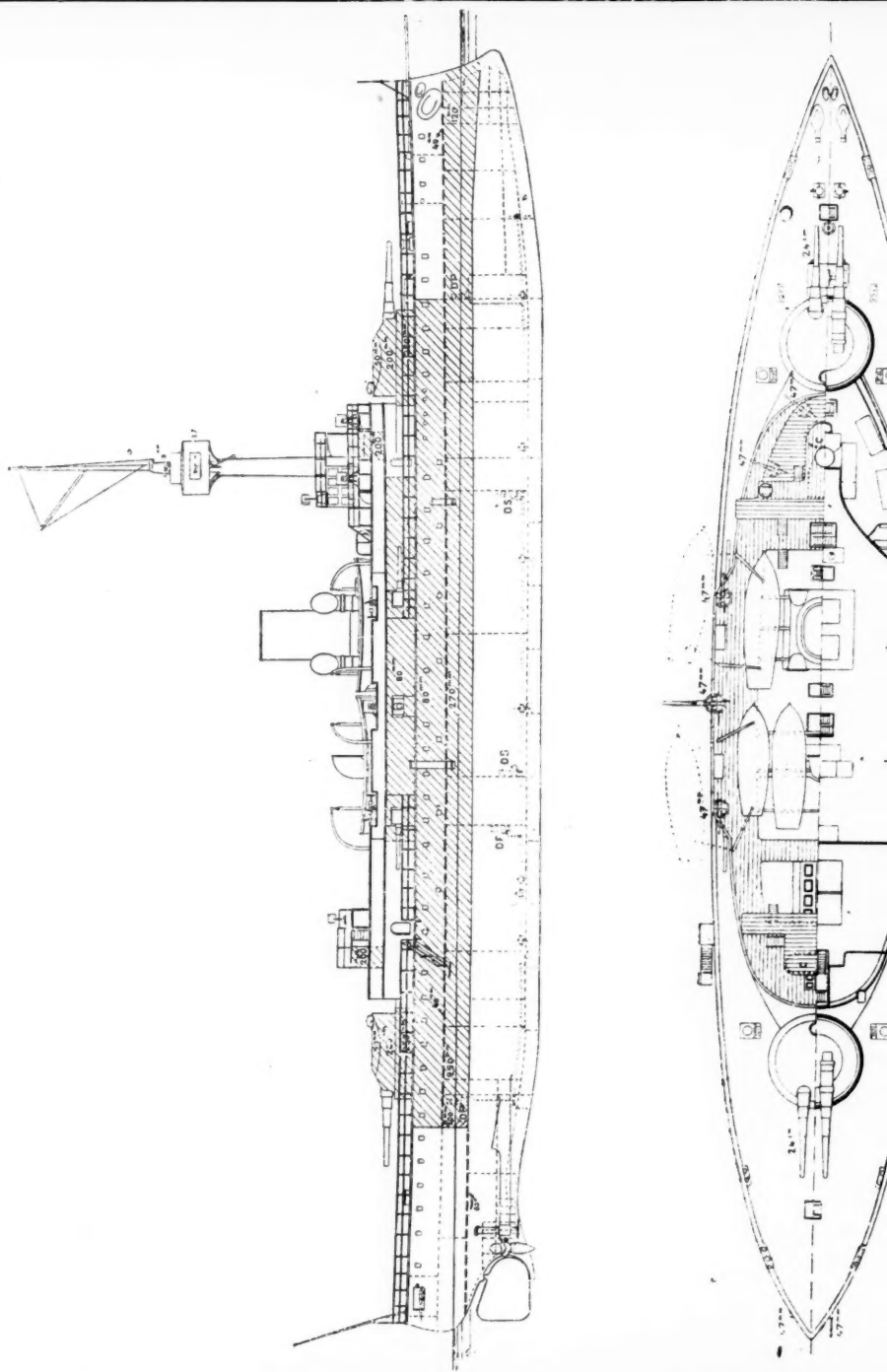
The principal dimensions are as follows :—

Length ... ..	303 feet 6 inches.
Beam ... ..	55 feet 3 inches.
Displacement ... ..	5,550 tons.
Mean draught ... ..	20 feet 6 inches.

The hull of the ship is constructed of Siemens-Martin steel, divided into the usual cellular and water-tight compartments, while the pumps will be sufficiently powerful to discharge 1,500 tons of water hourly in case of necessity. Protection is afforded by an armour belt of 10·8-inch steel, tapering to 8 inches aft, and 5 inches forward, which runs from the ram for five-sixths the length of the ship, extending from 3 feet 6 inches below to 3 feet 6 inches above the water-line at normal draught; the after ends being joined by an 8-inch armoured-athwart-ships bulkhead. On the top of the belt runs fore and aft the whole length of the ship a 1·8-inch armoured deck, rising above which, and extending from the after end of the armoured belt for about two-thirds of the ship forward, is a citadel protected with 3·3-inch armour, with transverse bulkheads of the same thickness of plating. Above again, on the upper deck, is a smaller citadel, also protected with 3·3-inch armour, fore and abaft which, but with their bases protected by the armoured lower citadel, are the two barbettes for the heavy guns, plated with 8-inch armour, and fitted with 2·5-inch steel hoods for the guns. There are further two conning towers, the foremost of 8-inch plating, the after of 2·5-inch. The whole weight of the armour amounts to 1,700 tons. The armament consists of four 24-centimetre (9·4-inch), 40-calibre long Krupp guns, mounted in pairs in the barbettes. Each gun weighs 26 tons, and the mountings for each pair of guns, including the hood, 123 tons. The armour-piercing projectile, which weighs 474 lbs., has an initial velocity of 2,275 feet. The secondary battery consists of six 15-centimetre (5·8-inch) Q.F. guns, two 7-centimetre Uchatius guns for boat and landing purposes, sixteen 3-pounder Q.F. guns, and two mitrailleuses with two broadside torpedo tubes. The six 15-centimetre Q.F. guns are mounted in the citadel on the upper deck, two firing from right ahead to 70° abaft the beam and two from right aft to 70° before the beam; the other two are on the broadside. The guns are separated from each other by steel splinter-proof bulkheads. Ten of the 3-pounder Q.F. guns are mounted on the super-structure over the upper deck citadel. The guns, barbettes, and ammunition hoists are all to be worked by electricity, the ammunition for the heavy guns and secondary battery being provided through separate armoured tubes. The engines are intended to develop 6,000-I.H.P. under natural draught, giving a speed of 16 knots, and 8,500-I.H.P. under forced draught, the corresponding speed being 17·5 knots. The coal capacity is 500 tons, giving a cruising radius of 3,000 miles at 10 knots. Although the ship is being constructed at the Imperial Dockyard, the engines are being made at Trieste at the Stabilimento Tecnico Triestino.

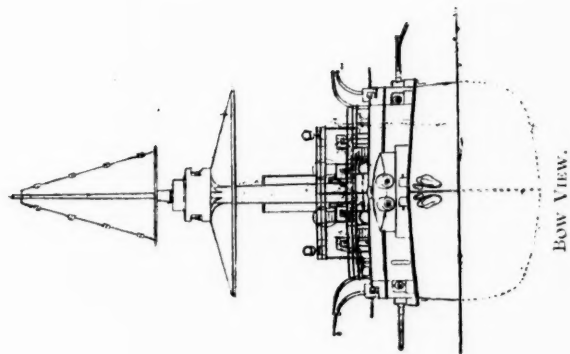
The Kaiser arrived at Pola on the morning of the 8th inst., accompanied by the Minister of War, General von Kriegshammer, the Chief of the General Staff, Baron Beck, Admiral Baron von Sterneck, the Commanding Admiral of the Navy, and other high officials. His Majesty took up his quarters on board the Imperial yacht "Miramar," and in the course of the day made some official inspections. On the afternoon of the 9th, after the launch, he held a review of the yachts of the Yacht Squadron, which was followed by a regatta. On the next morning the Emperor went on board the "Kronprinz Rudolf," flag-ship of the Manœuvre Squadron, and proceeded with the squadron to sea, witnessing target







Profile and Deck Plans of the new Austrian Coast defence Battle-ship "**MONARCH**," 5,550 tons; 8,500 I.H.P.





practice, etc.; while the next day was also spent in witnessing the squadron at fleet tactics. In the evening the Kaiser left for Vienna.

The squadron to be present at the opening of the North Sea and Baltic Canal will consist of the armoured ram cruiser "Kaiserin und Königin Maria Theresia" and the first class protected cruisers "Kaiserin Elisabeth" and "Kaiser Franz Josef I." Rear-Admiral H.I.H. the Archduke Stephen will hoist his flag on board the "Maria Theresia" in command of the squadron.—*Militär-Zeitung*.

In the December Notes of last year will be found a description of the "Maria Theresia," a colotype photograph of which ship forms the frontispiece for this month's Journal. The ship was then on the point of commencing her trials, which have since been successfully concluded. Under natural draught, with the engines making 104 revolutions and developing a mean of 5,880-I.H.P., a mean speed of 17.13 knots was maintained during a six hours' run; during the four hours' forced draught trial, with the engines making a mean of 119 revolutions and developing 9,755-I.H.P. with 2-inch air pressure, a mean speed of 19.3 was kept up without difficulty, while for one hour a speed of 19.9 was reached, the engines making 123 revolutions and indicating 10,300-H.P. The machinery worked smoothly throughout, and there was little or no perceptible vibration.—*Mittheilungen aus dem Gebiete des Seewesens*.

FRANCE.—The following are the principal appointments which have been made: Rear-Admiral—Fleuriais to the command of the Atlantic Naval Division. Capitaine de Vaisseau—Bernard to "Duquesne," as Chief of the Staff to Rear-Admiral Fleuriais; Ingouf to "Latouche-Tréville"; Bénier to "Neptune"; Marquis to "Marceau"; Foret to "Hoche"; and Huguet to "Dupuy-de-Lôme." —*Le Moniteur de la Flotte*.

The armoured cruiser "Dupuy-de-Lôme" has now completed her trials, and on the 15th inst. her crew was made up to the full sea complement, as was also that of the first class battle-ship "Hoche," the repairs and alterations to which ship having also been completed. Rear-Admiral Ménard, the second-in-command of the Squadron of the North, struck his flag, which has been flying on board the "Victorieuse," on the 10th inst., and re-hoisted it on board the "Hoche."

At her final trials the "Dupuy-de-Lôme," in fine weather and with the sea smooth, made a mean of 19.8 on the measured mile; the highest speed reached was 20.4; the mean revolutions of the central screw were 135, and of the side-screws 138 and 140, respectively. During a 24 hours' run a mean speed of 17 knots was maintained, the engines developing 6,250-I.H.P., the consumption of coal per H.P. per hour being 0.815 kilogramme.

The second class cruiser "Friant" has also finally completed her trials. As we have previously reported, during the forced draught trial, under unfavourable conditions of wind and sea, the vessel maintained a mean speed of 18.8 knots, the engines developing 9,503-I.H.P. or 500-H.P. over the contract. During a 24 hours' run, with twelve boilers alight out of twenty, a mean speed of 17.1 knots was maintained, the mean I.H.P. being 6,000, and the coal consumption per H.P. per hour 1.03 kilogramme. The trials of her sister-ship the "Chasseloup-Laubat" have not been so satisfactory, both her stability and speed leaving much to be desired.

Another trial of the submarine torpedo-boat "Gustave Zédé" has been made at Toulon. Several improvements have been made since the last trial, in the course of which it was found that the supply of air was insufficient for the needs of the crew. It was stated that this difficulty has been overcome to a great extent, and that the electric accumulators, which have been completely renewed, now work very satisfactorily. During her trial the vessel attained a speed of 8½ knots.



The Minister of Marine has given directions that the coast-defence battle-ship "Tréhouart," and the third class cruiser "Rigault-de-Genouilly," are in future to have the prefix "Amiral." The torpilleur-de-haute-mer "Lancier" has been relieved by the "Tourbillon," a new vessel of an improved type. The "Lancier" has been placed in the second category of the Reserve at Brest, where she will be grouped with other vessels of her class. The new torpilleurs-de-haute-mer "Filibustier" and "Sarrazin" have left Rochefort for Toulon, where they will be temporarily attached to the Reserve Squadron; but they are intended ultimately to replace the "Argonaute" and "Tourmente" in the Active Division of the Mediterranean Fleet.

The new gun-boat "Surprise" was launched at Havre on the 24th-ult.

The Minister of Marine has decided to abolish the present transport system, and from 1st January, 1896, the reliefs for Cochin-China and other stations will no longer be carried out by Government troopers. It is expected that this change will result in a real economy being effected, and that a yearly saving of from 600,000 to 800,000*fr.* will ensue from the transport being trusted to private companies. It is contended that the accommodation for the troops will be much better in the steamers belonging to the great companies, that the time occupied in the voyages will be much shortened, and an important and needful impetus given to the companies themselves, which up to now has been wanting. The Reservists of the Fleet—who form part of the classes of 1886-1888, or who voluntarily enlisted between the 1st January and 31st December, 1887, and the 1st January and 31st December, 1889—will be called out this year for twenty-eight days' training from the 1st July to the 28th inclusive.

The Parliamentary Committee of enquiry into the state of the Navy has been visiting the different dockyards, and was lately at Toulon, where Vice-Admiral Gervais, in command of the Reserve Squadron, was among the officers examined. Replying to a question as to the best tonnage for battle-ships, the Admiral pronounced himself against building battle-ships of too small a tonnage; and being asked if two ships of medium strength would not be able to successfully attack a battle-ship of the first class, he answered: "*Je n'admettrai jamais que deux hommes faibles puissent s'attaquer avec succès à un seul homme très solide.*"

Admiral Besnard, the Minister of Marine, speaking before the French Chambers on the Budget, stated that France has 41 per cent. of her ships in commission; England, 47 per cent.; Italy, 75 per cent.; Germany, 33 per cent.; Austria, 38 per cent.; Russia, 97 per cent.; and the United States, 60 per cent. In the same speech, Admiral Besnard, referring to the proper dimensions for battle-ships, remarked: "I believe, and I say it after consultation with the constructors and my officers, that our interest is to build up our fleet of handy vessels, manœuvring rapidly, and able at need to deliver a blow with the ram. That is my profound conviction. If we were in action with the enormous Italian ships of 14,000 and 15,000 tons, with turning circles of 1,000 or 1,200 metres, while that of the "Jemmapes," for example, does not exceed 300 metres, I believe that our vessels would prove very formidable to those apparently more powerful adversaries."—*Le Yacht, Le Moniteur de la Flotte, and Le Temps.*

GERMANY.—The following is the list of foreign ships of war, which, as at present arranged, are to represent their different countries at the opening of the North Sea and Baltic Canal next month:—

*Austria-Hungary.*—Armoured ram cruiser—"Kaiserin und Königin Maria Theresia," flag-ship of Rear-Admiral H.I.H. the Archduke Stephen. First class protected cruisers—"Kaiserin Elisabeth" and "Kaiserin Franz Josef I."

*Denmark.*—Third class cruisers—"Geiser," flag-ship of Rear-Admiral Brunn "Heckla," and four torpedo-boats.

*France*.—First class battle-ship—"Hoche," flag-ship of Rear-Admiral Ménard. First class armoured cruiser—"Dupuy-de-Lôme. Third class cruiser—"Cosmao."

*Great Britain*.—First class battle-ships—"Royal Sovereign," flag-ship of Vice-Admiral Lord Walter Kerr; "Empress of India," flag-ship of Rear-Admiral Alington; "Repulse," and "Resolution." "First class protected cruisers—"Blenheim" and "Endymion." First class gun-boats—"Speedy" and "Halcyon."

*Italy*.—First class battle-ships—"Sardegna," flag-ship of Vice-Admiral H.R.H. the Duke of Savoy; "Re Umberto," flag-ship of Vice-Admiral Accinni; "Andrea-Doria," and "Ruggiero di Lauria." Ram-torpedo cruisers—"Stromboli" and "Etruria." Torpedo-cruisers—"Aretusa" and "Partenope."

*The Netherlands*.—First class protected cruiser—"Atjeh." Third class cruiser—"Alkmaar."

*Norway*.—First class gun-boats—"Viking," "Sleipner," and six first class torpedo-boats.

*Portugal*.—Corvette—"Vasco da Gama."

*Roumania*.—Protected-cruiser—"Elizabeta." Despatch-vessel—"Mircea."

*Russia*.—First class battle-ship—"Imperator Nicolas II.," flag-ship of admiral commanding. First class armoured cruiser—"Rurik." First class armoured gun-boat—"Groziastchy."

*Spain*.—First class battle-ship—"Pelayo," flag-ship of rear-admiral commanding. First class armoured-cruiser—"Infanta Maria Teresa." Second class protected cruiser—"Marques de la Ensenada."

*Sweden*.—Coast-defence turret-ships—"Thule," flag-ship of rear-admiral; and "Göta." First class gun-boat—"Edda."

*Turkey*.—Cruiser-corvette—"Hejbet-Numa."

*United States*.—First class armoured cruiser—"New York," flag-ship of Rear-Admiral Meade. First class cruisers—"Columbia" and "San Francisco," flag-ship of Rear-Admiral Kirkland. Second class cruiser—"Marblehead."

Making a total of over fifty foreign vessels of war, with twelve admirals, and about 17,000 officers and men.

About thirty German men-of-war will also be present, with four torpedo-boat divisions, their crews numbering some 11,000 officers and men.

The place where every ship to be present is to moor has been already settled, and the order in which the ships of the different fleets will lie is as follows:—

Commencing from the head of the harbour and stretching seawards will come first the four German coast-defence ships—"Heimdall," "Hagen," "Hildebrand," "Fritjof," and the two cruisers—"Gefion" and "Kaiserin Augusta." Continuing the line are the Danish ships—"Hekla" and "Geiser," and next in order will follow the four American ships—"Marblehead," "San Francisco," "Columbia," and "New York." This line will lie nearly North and South, and inside or to the Westward will be placed the German avisos—"Grille" and "Meteor," and the battle-ships—"Württemberg," "Sachsen," and "Baiern," the English cruiser "Endymion" lying between the "Baiern" and the American ships, while in shore will be anchored the torpedo-boat flotilla. Next will come the Central Division moored in four parallel lines as follows, beginning from the West:—

## FIRST LINE.

German dispatch vessel—"Blitz"  
 " battle-ship—"Wörth"  
 " "—"Weissenburg"  
 " "—"Kurfürst Friedrich Wilhelm"  
 " torpedo-avisos—"Pfeil"  
 "—"Jagd"  
 English Admiralty yacht—"Enchantress"

## SECOND LINE.

German battle-ship—"Baden"  
 English "—"Repulse"  
 " "—"Resolution"  
 German "—"Brandenburg"  
 English "—"Royal Sovereign"

Close to the entrance to Canal.

## THIRD LINE.

English cruiser—"Blenheim"  
 Portuguese cruiser—"Vasco di Gama"  
 French "—"—"Dupuy-de-Lôme"  
 English battle-ship—"Empress of India"  
 German gunnery-ship—"Mars"

## FOURTH LINE.

German torpedo-ship—"Blücher"  
 French battle-ship—"Hoche"  
 English gun-boat—"Halcyon"  
 "—"—"Speedy"  
 "—"—"Bellona"  
 French cruiser—"Cosmao"

Next to the mouth of the Canal will lie the Imperial yachts—"Hohenzollern" and "Kaiser-Adler," and the four large Hamburg and Bremen-American liners, on board of which the bulk of the distinguished guests will be housed. Then will come the 3rd Division, also moored in four lines.

## FIRST LINE.

Russian battle-ship—"Alexander II."  
 "—"—"armoured gun-boat—"Groziastchy"  
 Spanish cruiser—"Marques de la Ensenada"  
 Norwegian gun-boat—"Viking"  
 "—"—"—"Sleipner"  
 Swedish "—"—"—"Edda"  
 Netherlands cruiser—"Alkmaar"

## SECOND LINE.

Russian armoured cruiser—"Rurik"  
 Spanish battle-ship—"Pelayo"  
 "—"—"cruiser—"Infanta Maria Teresa"  
 Swedish turret-ships—"Göta" and "Thule"  
 Netherlands cruiser—"Atjeh"

## THIRD LINE.

Italian Royal yacht—"Savoia"  
 "—"—"battle-ships—"Sardegna"  
 "—"—"—"—"Re Umberto"  
 "—"—"—"—"Ruggiero di Lauria"  
 "—"—"—"—"Andrea Doria"  
 "—"—"—"—"cruiser—"Stromboli"  
 "—"—"—"—"—"Etruria"

## FOURTH LINE.

Austrian armoured cruiser—"Kaiserin und Königin Maria Theresia"  
 "—"—"cruiser—"Kaiserin Elisabeth"  
 "—"—"—"—"Kaiser Franz Josef I."  
 German frigate—"Stosch"  
 "—"—"—"—"Stein"  
 "—"—"—"—"—"Moltke"  
 "—"—"—"—"—"Gneisenau"

In shore in Heikendorf Bay, will be the Italian torpedo-cruisers—"Partenope" and "Aretusa"; the Roumanian cruisers—"Elizabeta" and "Mircea"; the Turkish corvette—"Hejbet-Numa," and an Austrian store-ship.

We regret that, owing to an unavoidable delay, we are obliged to defer until next month a full description of the Canal, with chart and plans.—*Neue Preussische Kreuz Zeitung.*

The following programme has been published semi-officially, but is, of course, subject to revision. The Kaiser is to arrive at Hamburg at 11 a.m. on the 19th June, and will be accompanied by twenty-two Princes of the Empire. The other invited guests will already have assembled at Hamburg. At 9.30 p.m. on the same day all the vessels, with the exception of the Imperial yachts, will leave the Lower Elbe and anchor off Brunshausen. The "Hohenzollern" and "Kaiser-Adler," on board which the Kaiser and Princes will spend the night, will weigh 9.30 the next morning, proceeding to Brunsbüttel, and they will enter the Canal about 3 p.m. Some twelve or fourteen ships will take part in the procession through the Canal, among which, beside the Imperial yachts, will be the battle-ship "Wörth," the Admiralty yacht "Enchantress," and three vessels of the Hamburg-America and the German Lloyd's Lines. As the speed going through the Canal is not to exceed 10 knots, the ships will have to anchor off Rendsburg for the night, arriving there between 8 and 9 p.m. The next morning there will be a parade of part of the troops of the 9th Army Corps, in which men landed from the ships will also take part. The route will then be continued to Holtenau, the Baltic exit of the Canal, where the ships are timed to arrive about 1 p.m. After

the arrival at Kiel, a reception will be held by the Kaiser of the representatives of the foreign Powers, and the foreign admirals, whom he will also entertain at a banquet on board the "Hohenzollern" in the evening. The next day the Emperor will make a grand inspection of the assembled German and foreign ships, and in the evening the foreign officers will be entertained by him and the German Naval Authorities on board the "Hohenzollern," "Kaiser-Adler," and other vessels prepared for the occasion. The next morning the Kaiser returns to Berlin.—*Militär-Zeitung*.

The Squadron in the East is to be reinforced by the second class battle-ship "Kaiser," to which, on arrival, Rear-Admiral Hoffman will transfer his flag from the "Irene," and also by the second class cruiser "Prinzess Wilhelm." Kapitän-zur-See Jaeschke has been appointed to the former, and Corvette-Captain von Holtzendorf to the latter. Both ships have left for their destination.—*Neue Preussische Kreuz Zeitung*.

JAPAN.—The following particulars in reference to the two large battle-ships now under construction in England are of interest. As far back as 1883 a first enquiry was made in this country through Admiral Ito, the commander of the Japanese Fleet in the war with China, for the construction of two powerful armour-clads of an improved "Collingwood" type; limited, however, to a displacement tonnage of about 8,000 tons. It being found difficult to improve upon this type of vessel with 1,500 tons less weight, the limiting tonnage was increased to 10,500 tons, or equal to a vessel of "Centurion" type, but the proposed new warships being required to carry a heavier armament than a "Centurion," the displacement was eventually increased to 12,450 tons, the vessel to be of "Royal Sovereign" type. A commission was then appointed, composed of two naval officers, Captain Kitura Yendo, Naval Attaché in London, and Lieutenant Yamanoutche, together with Commanders Myabara and Takayama, of the Constructive Department, who visited the most important shipbuilding establishments on the Continent and in America, and from their reports it was at length decided to place the order for the construction of both vessels in this country, one with the Thames Ironworks and Shipbuilding Company, London, and the second with Messrs. Armstrong and Co., Newcastle-on-Tyne. As the two vessels are to be sister-ships, the following particulars of the one now under construction by the Thames Ironworks Company, to be named the "Fuji Yama"—after the celebrated mountain in Japan—will apply to both. The length between perpendiculars is 374 feet, the beam 73 feet, and the displacement 12,450 tons, giving a mean draught of 26 feet 6 inches, at which draught the coal carried is 700 tons; bunker capacity, however, being provided for 1,100 tons. The armour belt (which is of Harveyised steel plate, the hardening of which has been greatly improved upon in this country by the firms—Messrs. Cammel and Co. and Messrs. Vickers and Co.—who provide the armour for these vessels), which extends for 226 feet in length, is 18 inches thick in way of machinery and boiler spaces, and 16 inches at the ends. Each vessel has two barbettes, plated with 14-inch armour, and standing upon the steel armour deck which extends from stem to stern, and is 2½ inches thick, a screen of 6-inch armour runs across the main and lower decks to protect the guns from a raking fire. The armament of each vessel, the whole of which is to be supplied by Messrs. Armstrong and Co., comprises two 12-inch breech-loading guns in each barbette, ten 6-inch Q.F. guns in casemates, twenty 3-pounder, and four 2½-pounder Hotchkiss Q.F. guns, together with five torpedo-ejectors, one above water and four below. There are to be two military masts, with double tops, to each vessel, and five search-lights, and throughout they are to be internally lighted by electricity. The propelling machinery of the "Fuji Yama" and her sister-ship is now under construction by Messrs. Humphrys, Tennant and Co., of Deptford, and will consist of twin screw, three cylinder triple-expansion engines,

designed to develop 13,500-I.H.P., with moderate forced draught; the boilers for supplying steam will be ten in number, of the four-furnaced cylindrical type, worked at a pressure of 155 lbs. per square inch. The construction of the "Fuji Yama" is being rapidly proceeded with, the whole of the vessel being in frame, and a large proportion of the side plating amidships as far up as the armour-shelf is in place and rivetted up, and no delay is to be made in the work till completed. Notwithstanding the great pressure which was exerted in Tokio to obtain permission for other firms to compete for the construction of the "Fuji Yama" and her consort, the two above-mentioned were the only ones invited to tender for the vessels.—*The Times*.

UNITED STATES.—The following is the stage of completion reached by vessels now building for the United States Navy:—"Indiana," 93 per cent.; "Massachusetts," 90 per cent.; "Brooklyn," 42 per cent.; "Iowa," 35 per cent.; "Katahdin," 90 per cent.; "Oregon," 89 per cent.; gun-boat "No. 7," 31 per cent.; gun-boat "No. 8," 25 per cent.; gun-boat "No. 9," 26 per cent.; "Maine," 98 per cent.; "Puritan," 87 per cent.; "Terror," 96 per cent.; "Amphitrite," 99 per cent.; "Texas," 95 per cent.; and "Monadnock," 85 per cent. The two new coast line-of-battle-ships about to be added to the United States Navy are to cost, exclusive of armament, a sum not exceeding £800,000 each. They are to be designed to carry the heaviest armour and the most powerful ordnance upon a displacement of about 10,000 tons. Six light draught composite gun-boats, which are also about to be added to the naval establishment of the United States, are to cost not more than £46,000 each. One of the new coast line-of-battle-ships is to be named the "Kearsage."

The Secretary of the Navy has entered into a contract with the John P. Holland Torpedo Boat Company, of New York, for building a submarine torpedo-boat at a total of \$150,000. The principal dimensions of the boat are to be: Length, 80 feet; diameter, 11 feet; and displacement, 138½ tons. Government inspectors are to watch the construction of the craft, and all the material used in it is to be of domestic manufacture. The boat is to be completed in every respect by the 26th of March, 1896, and in case the completion should be deferred penalties will be exacted. When completed in every respect her trial will occur. Under the conditions guaranteed the vessel is to give not less than 15 knots when in a light condition; 14 knots when awash, with a minimum endurance at these speeds, using only steam power, and 8 knots an hour when the vessel is completely submerged, with a minimum endurance of 6 hours at this speed. If the speed developed by the vessel upon the trial falls below 13½ knots for the light condition or 12½ knots for the awash condition, or 6½ knots when submerged, the secretary is given discretion to reject the vessel or to accept her at a reduced price.

The Secretary of the Navy has approved designs for the turrets for the 3-inch breech-loading rifles of the battle-ship "Iowa." They will be circular in shape and vertical. Instead of 5-inch armour, as was originally contemplated, the port plates of the turrets will be 8 inches in thickness, and the side and rear plates will be 7 inches thick. The Bureau of Construction and Repair has submitted to the secretary, through the Ordnance Bureau, designs for the turrets of the 12-inch guns for the "Iowa." These turrets will be elliptical in shape instead of circular, and will be vertical. The armour will be 15 inches in thickness.—*Army and Navy Journal*.

### MILITARY.

HOME.—A new field-glass has been recently brought out by Lieut-Colonel Sawyer, of the 45th (Rattray's) Sikhs, which seems to meet in a most satisfactory manner a long-felt want.

Every mounted officer knows the difficulty of managing a pair of binoculars on a frightened or plunging horse. Two hands are required to free them from their

case and two to adjust the focus. Moreover, on account of the bulk, they are an exceedingly awkward affair to carry anywhere except on the saddle, and the consequences of the last arrangement usually are, that at the moment the glasses are most needed they are discovered to be with the led horses, some 100 yards to the rear, under cover.

Colonel Sawyer's clever arrangement removes all these drawbacks. The glasses are made flat in section, not cylindrical. They can be conveniently worn on the waist-belt, and they can be disengaged from their case and focussed all by the help of one hand only.

The invention is being worked by a syndicate, having its offices at 60, Queen Victoria Street, London, who will, doubtless, reply to all enquiries.

#### A NEW FLYING MACHINE BY MAJOR R. F. MOORE, R.E.

Major R. F. Moore's flying machine consists of two wings made in imitation of those of a flying fox, and a body or central frame carrying the motive power and man.

The wings on the air are balanced by powerful springs against the weight of the body, so that the machine is in equilibrium when supported at the centres of pressure of the wings.

When these springs are actuated they cause the wings to flap up and down. The wings, by their flexibility and shape, cause flight as in nature when the machine is in the air.

The springs, with a special direct-acting electro-motor that has been designed to actuate them, resemble the pectoral muscles in a bird or bat. The springs and motor represent the fibre of the muscle, the electric wires the nerves, the electric current from the battery the generator of the power that works the muscles.

The springs are selected to give the proper number of oscillations required for the particular strain on them. By their resilience they give the quick action necessary for the wings. Marey, in his book on "Animal Mechanism," p. 215, attributes the rapid production of movements in the muscles of birds to some chemical action which, he says, is propagated more readily in the muscles of birds than in those of any other animal. This is erroneous, as it is due to the resilience in the muscles when under a strain.

The weight of the body being balanced against the leverage of the wings on the air, the power necessary to flap the wings is that required to overcome friction and the pressure in the down stroke on the air required to produce horizontal flight. The more efficient the wings are for horizontal driving, the greater the load that can be put on them per square foot of area. The total weight of the machine can be kept within that of similar sized bats or birds.

The rate of translation in the air will depend on the efficiency of the wings in their construction and the amount of power put into them.

The wings are like two parachutes placed side by side, and made to flap so as to produce a driving force by their flexibility.

They have cords attached to them, so that in case of any accident when in the air, the wings, which cannot rise above the horizontal, would act like parachutes.

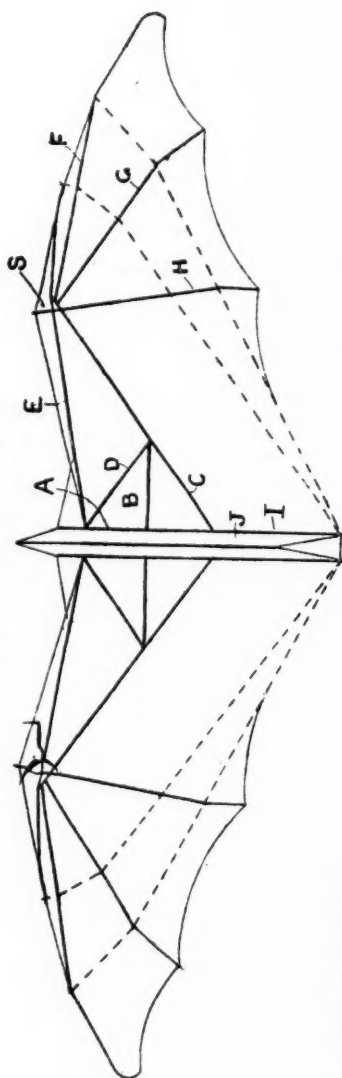
For the first experiments the machines will be made to fly without the weight of the man; afterwards, when they have been thoroughly tested, extra weight will be added till their full efficiency is developed.

The chief advantages of the machine, using the direct-acting electro-motor, are:—

(a) Economy of work in driving, there being no friction as with rotatory machinery.

(b) Simplicity in the parts, as there is no complicated machinery to get out of order.

Figure 1 (shows plan of wings).



- |   |   |     |   |
|---|---|-----|---|
| $\left. \begin{array}{l} A \\ B \\ C \\ D \end{array} \right\}$ | indicates the hinge for wing.                 | $J$ | the backbone for strengthening the framing. |
| $\left. \begin{array}{l} E \\ F \\ G \\ H \end{array} \right\}$ | the framing on which the wing is constructed. | $I$ | the flexible rib at the tail.               |
|   | the flexible ribs at the top of the wing.     | $S$ | a strong strut in extension of $H$ .        |
|   |   | $E$ | a strong stay for distending the wing.      |



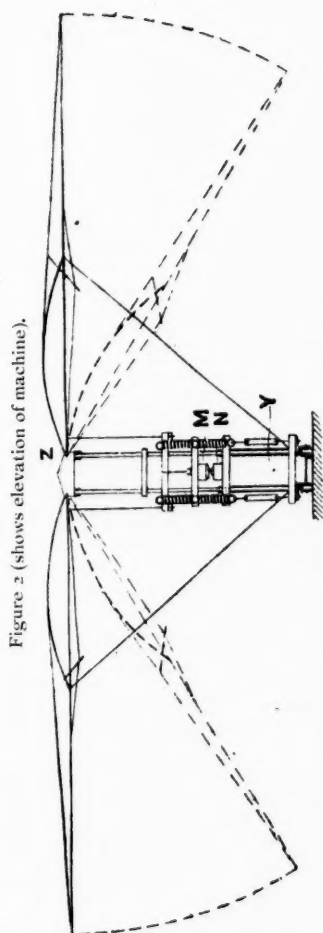


Figure 2 (shows elevation of machine).

Z indicates the central frame with the hinges for the wings,  
 M } the direct-acting electro-magnets for actuating the springs at  
 N } their sides,  
 Y the space for the man and the electric batteries.

FRANCE.—*Mobilisation of the Garrison of Paris.*—On the night of the 8th-9th April a surprise mobilisation of a part of the Paris garrison took place. The troops affected were the 1st Division of Cavalry, consisting of the 1st and 2nd Cuirassiers in Paris, the 27th Dragoons at Versailles, the 28th Dragoons at Vincennes, the 4th Chasseurs at St. Germain, the 5th at Rambouillet; the horse batteries from the École Militaire, and the 29th Battalion of Chasseurs at Vincennes; the 9th Division of Infantry, comprising the 4th, 82nd, 115th; and 131st of the line, quartered respectively, the two former at Reuilly, the others at Tourelles and at Château-d'Eau.

With some few exceptions, rendered necessary by circumstances, the scheme laid down for war mobilisation was rigidly adhered to. It being impossible to requisition from private owners the horses required, these were taken from the troops left in barracks; but this was the only deviation practised, otherwise reality was sternly adhered to, the officers even drawing their field allowances—but—only on paper.

The mobilisation completed, the troops marched to their entraining stations and were put on board their respective trains.

The stations utilised were: Pantin, la Villette, la Chapelle, Bercy, Versailles, Saint Germain, Rambouillet.

The operations throughout were conducted with rapidity and punctuality, and have given the greatest satisfaction.

*Autumn Manœuvres.*—The following are the arrangements for the manœuvres during the next Autumn:—The Armies and Army Corps will be out for twenty days—the Divisions for fifteen days, Brigades twelve days, including the time necessary for the marches of concentration and dispersion.

The cavalry will drill in Brigade for eight days, then be formed into Divisions and manœuvre for twelve days.

The infantry companies are to be made up to a marching-out strength of not less than 150, or more than 180 rifles, and the squadrons at least 100 sabres; but the batteries, with few exceptions, will take the field with only four guns and three wagons.

#### FORTIFICATION

##### SINCE THE INTRODUCTION OF HIGH EXPLOSIVE SHELLS.

*Continued from p. 311. (Reprinted by permission from the R.E. Corps Journal.)*

*Different Kinds of Shelters.*—The number of these places is much less than in the old forts, because the number of guns and the strength of the garrison is much less. No attempt is made to shelter more than two-thirds of the garrison; the other third are lodged in guard-houses, where the men can rest on benches or camp beds. The shelters are arranged so as to form one war-barrack, which is placed at the back of the fort with its face towards the gorge. They are sometimes placed under the parapet. They consist of a series of consecutive arches (*Fig. 1, Plate XXI.*), whose span varies from 10 to 16 feet, with a height of  $8\frac{1}{4}$  to 9 feet for camp beds in one tier, or of  $11\frac{1}{2}$  to 13 feet for two tiers. The depth of this shelter is from 33 to 50 feet, but under no circumstances should it exceed 60 feet, on account of the difficulties of ventilation. A communicating gallery from 5 to 8 feet wide usually passes along the front.

The barrack is covered over on all its faces by a thickness of 8 feet of cement concrete, except on the front face, which has only 5 feet, and which is often the escarp wall of the gorge. The upper surface, which is horizontal, joins the vertical portions by a rounded angle, and is covered with a cushion of natural soil not more than 18 inches thick. Those vertical portions which are exposed to direct shots are carried down far enough so as not to be blown up, and they are further protected by an earthen mass 33 feet thick at least, of which at least 13 feet next to the concrete consists of sand, gravel, or stones.

Air and light are obtained through small openings, often in the form of loop-holes, placed as high as possible. These openings are provided with steel shutters. The ventilation is effected in some works by means of cylindrical chimneys, 1 foot in diameter, through the back of the casemate.

In order to protect, during the bombardment, the men in charge of the ramparts, as also the men for working the light pieces, the pieces themselves and their ammunition, it appears advisable to form, at the salients for preference, a certain length of hard parapet, with the superior slope and banquette in concrete, in which are arranged parallel to the crest bomb-proof shelters, without any great increase of expense (*Fig. 2, Plate XXI.*).

*Accessory Buildings.*—Such accessory buildings as kitchens, latrines, and the different magazines will be easily provided for. The doctors will only require a small place for first dressings, and the engineers a store for tools. The artillery will have magazines only for the necessary made-up ammunition for the light pieces for the whole siege. Six small stores will suffice for these purposes, and they must be proof against everything. The magazines for the guns in tourelles are in the tourelles themselves.

The entrance into the fort is generally at the bottom of the gorge ditch; it can be duplicated by an entrance over a drawbridge at the level of the terreplein.

An armoured observatory will complete the arrangements of the fort.

#### EMPLACEMENTS FOR THE ARTILLERY—BATTERIES.

*General Arrangements.*—We have seen that the heavy artillery can no longer remain in the fort, exposed to the new form of bombardment. Two solutions are offered to improve the situation: to cover the artillery with armour, or to distribute it in the intervals. Cupolas and tourelles are only employed in a partial manner in France and Germany for the heavy pieces. A circular of 22nd July, 1887, has settled that we must recognise the principle of distributing these pieces in shallow order outside the forts, and of echelonning the magazine in the way of depth, so that the enemy's artillery should find it difficult to hit them. It is then allowed that what is properly called the fighting artillery (*l'artillerie de combat proprement dite*) will be distributed in the intervals between the forts—where it will be arranged either in *sunken batteries*, similar to those for the siege, when we have a battery on the crest of a hill for long guns; or simply on platforms on the ground level for *hidden batteries* intended for high-angle fire.

At the same time, there must always be cases in which the ground does not lend itself to the installing of a sufficient number of pieces in the intervals, and it will then be necessary to have recourse to disappearing tourelles for direct fire, or to the ordinary tourelles hidden by a covering mass for curved fire. These tourelles would be placed inside the forts, or, preferably, outside them, but under their immediate protection.

*Sunken Batteries.*—The batteries on the crest of a hill are armed with pieces intended for firing at a long range, so that they can be placed so far back as not to be seen, and even on counter-sloping ground. At a pinch these batteries could be constructed when the fortress itself was placed in a state of defence, and would be very simple; but it appears better to have a type, for the sake of uniformity in the organisation, and we will now describe one. The terreplein is dug out 6½ feet deep (*Fig. 3, Plate XXI.*), but the battery is generally cut out of the natural soil just so far that its parapet presents no apparent relief. Each platform, about 20 feet long and 16 to 20 feet wide, has a slope at the end of ¼ to ⅓, to act as a ramp for arming, and is separated from the next platform by a traverse from 40 to 50 feet thick, formed from the natural earth, so that each piece has its platform encased between two traverses. On each side of the platform are small passages for the gunners. Ammunition recesses in the form of mine galleries are arranged either on the slope of the epaulment in the front of the battery, or at the back of the traverses, or even in a passage which extends beyond the battery. A continuous communication passes, at about 70 feet in the rear of the platforms.

To prevent the enemy from making out such a battery at 100 or 200 yards, care is taken to scatter the excavations in depressions in the neighbouring soil, or to make a mask of it placed some 50 or 100 yards in front of the pieces. If the earth then did not entirely hide the battery from view, it would be further masked by plantations of evergreen shrubs.

To protect the batteries from sudden assaults or surprises to which their position lays them open, they are covered by troops in front and surrounded by obstacles.

The gunners for these batteries, in the intervals, will be quartered in excavated caverns or concrete shelters, or in villages or barracks.

*Supplying the Batteries.*—The recesses in the batteries only hold a certain number of rounds; their refilling with ammunition is arranged for by means of a railway line passing close to them, but hidden from view by the ground itself. This ammunition is distributed into the battery magazines, the section (or intermediate) magazines, and the main magazines.

*Hidden Batteries.*—The batteries intended for high-angle fire, placed completely out of sight, might consist simply of platforms laid on the natural soil, with no epaulment. To allow of regulating the fire, some improvised observatories will be established in front of the crest lines, connected with the batteries by electrical and telephonic communications.

#### THE LINE OF INFANTRY INTRENCHMENTS.

*Arrangement.*—The battery position is protected in front by a line of infantry intrenchments thrown up at 2,000 to 3,000 yards in front of the main line, and supported by the artillery of the latter. During the first period of the siege this line of field fortifications, with epaulments for light guns (16-pounders), will be called upon to hold on as long as possible. Afterwards, this line will be drawn back to between the forts, and will be occupied by infantry, established in fighting positions, either natural or artificial, and by the artillery who have taken part in the advanced defence.

#### COMMUNICATIONS.

*Object.*—The arrangement for the main line of defence would not be complete unless there was a network of roads joining the different portions together, so as to insure the rapid supply of ammunition to the guns, and to assist the defence by the means of concentration of the necessary materials at threatened points. Good communications also allow of quickly shifting those guns which are too much open to the fire of the attack.

From this last point of view some engineers have designed "running platforms" or "truck mountings" for use on rails, so as to give by *mobility* to the artillery of the defence the means of escaping from the fire of the enemy. But, for various reasons it was recognised that this could only be employed under special conditions. To commence with, the putting in practice of this system of moving guns would require very constant changes; and, further, a too constant shifting of guns would cause difficulties of controlling their fire and of providing them with ammunition.

*Description.*—In order to connect up the details of one section of the defence amongst themselves and with those of the neighbouring section, it will be necessary to have *circular roads*, whilst *radial roads* will connect up the fighting line with the central reserve (*noyau central*), and, consequently, with all the sections. These communications are distinguished as *common roads* and *railroads*; the latter form a network partly *fixed* and partly *mobile*.

*General Conditions.*—Communications of any kind should satisfy the following conditions, which must be applied in an intelligent and practical manner:—

1. They must not compromise the safety of the place, *i.e.*, they must be well guarded and seen into.
2. They must be safe and always practicable for the defenders, *i.e.*, they must be screened from the enemy.

3. The enemy must not be able to use them, *i.e.*, that those portions which it will be necessary eventually to give up to the enemy must be well swept from positions in rear.

4. They should be each for a special purpose, so as to avoid crowding and confusion. It will be advisable to surround the central defence with a circular road, with large and well-defended openings in the enceinte, so as to allow of the passing out of troops under all circumstances without a check.

5. They should be simple, of ample width, and sufficiently large, and easily recognisable. With this view, it is important to increase the number of finger posts, showing clearly where the roads and bye-roads lead to.

*Railroads.*—The ordinary roads being insufficient for carrying out all the transport work, the Minister of War issued a circular on the 20th September, 1888, concerning the construction and use of narrow-gauge railways in the defence of a fortress. They are primarily required for transporting the heavy and cumbersome *matériel* of the artillery, and occasionally for transporting men and *matériel* of the other branches. A gauge of 2 feet on the Péchot system, a modified Decauville, has been adopted. It is as far as possible laid direct on the side of existing roads. The engineers are charged with the construction of the line; the working is entrusted to the artillery. The rolling-stock comprises engines with two fire-boxes and two chimneys, and wagons consisting of large platforms carried on two trucks with three axles to each.

The *permanent* or *fixed* portion of this line comprises all those routes which connect the *permanent* portions of the fortress. The *movable* or *temporary* portions laid by the artillery, when required, consist of those portions which it has not been possible to lay beforehand. The tractive force is supplied by locomotives beyond the zone exposed to fire, by manual power and horses in the dangerous zones. Where steep hills exist it has been found necessary to make use of a cable and inclined plane.

*Electrical Communications.*—Electrical and telephonic communication is necessary to connect permanently the different works with one another and the central defences. In order to communicate with the *outside world*, *subterranean* telegraphs, *heliographs*, *balloons*, and *pigeons* are used.

#### SECOND LINE OF DEFENCE, OR INTERMEDIATE POSITION.

*Arrangements.*—The general object of this line is to act as a support to the first line, to continue the struggle, under favourable conditions, after the loss of the latter, and to keep together its defenders.

The *choice of positions* for infantry, artillery, and tactical points of the line is governed by the same conditions as those for the main line, taking into account the relations which must be maintained between these new positions and the ground in front of them. There is no reason why these positions should be very distant from the main line; they may, in fact, support it strongly, but if they are too close to it they will be exposed to shells which were meant for the main line.

The flanks are rested on forts of the first line still in a position to continue the struggle; they are the weak points of this intermediate position, and should be strengthened in every possible way, for one cannot lose sight of the fact that the besieger, in possession of the advanced works, is just in the position to attack on the flank or in reverse those forts which form the flanks of the intermediate position.

The arrangements of the position will be made on the same ideas as the main line. It will necessarily entail a line of artillery, supported and flanked by field works.

*Line of Artillery.*—This line will comprise a series of positions for infantry and batteries. Amongst the latter those armed with light pieces, and of small calibre (4-inch and 5-inch), will have a direct view and good effect on the main line of defence and its neighbourhood; the others, screened from view and armed with long-range pieces (5-inch and 6-inch), or high-angle pieces (6-inch), would fire on

fixed targets, such as the forts and main line of defence, so as to prevent the enemy from getting possession of them.

These different batteries will be armed with such guns as are available either from the disarmed batteries or from the sections of defence which are not attacked.

The *field-works* intended to flank the line of artillery would not be at a distance of more than 3,000 yards apart. When they are made in peace-time they will be arranged much like the intermediate works of the main line. In certain places, such as Paris, Lyons, Verdun, etc., the second line would be entirely or in part formed of the old detached forts, which are at present considered to be too near to the central defences (*noyau central*).

When they are not prepared beforehand, these works can no longer be of the semi-permanent character, for nowadays wood and iron would be insufficient for satisfactory shelters, and one cannot think of making them in concrete. It will be necessary, then, to arrange them with a simple but very thick parapet with banquettes covered with sheet iron against shrapnel, with serious obstacles as accessory defences. Certain portions of the banquette might be arranged for light pieces, brought into action at the last moment.

A *third line of defence* could, under exceptional circumstances, be arranged in much the same manner as the second; but there are always the central defences to back up the second line, serving as a refuge to the defenders and a new starting-point for the defence.

#### THE CENTRAL DEFENCES (NOYAU CENTRAL).

*Arrangements.*—The necessity for such defences appears to be no longer contested, but the system of an enceinte of closed forts joined together by weak lines (*enceintes morcelées*) should nowadays be absolutely proscribed. For, since the artillery of the present time is able to drop easily in a very small space a considerable number of high-explosive shells whose destructive power is enormous, the forts would soon be destroyed. The only way would be to construct them like visible forts, with cupolas and concrete, which would be much too expensive considering the part the enceinte has to play.

Encientes of great extent present considerable advantages, but, on the other hand, they are expensive, and require many men for their defence. In the trace of an enceinte it is often necessary to take notice of the lie of the ground, which will often insist on a certain position, notwithstanding grave disadvantages. As it is all-important to flank the ditch, it appears advisable to return to the bastion trace very much flattened and with short flanks.

*Profile.*—The amount of strength to be given to the profile would vary according as we are considering those portions of the enceinte which are likely to be specially exposed to the enemy, or those that are likely to be less so.

But the enceinte should in all parts be strong against escalade. For the less exposed portions it is allowed that the obstacle is sufficient when it consists of an iron palisading 13 feet high placed at the top of the escarp of a small ditch 10 to 13 feet wide flanked by arranging the trace. In the more exposed portions the obstacle should consist of a ditch 26 to 33 feet wide, and at least 13 feet deep, with an ordinary masonry counterscarp, and strengthened by a palisading on the escarp at the most exposed portions, as, for example, at the salients. In this case the earth parapet should have a thickness of 33 to 40 feet, and a moderately high and uniform relief, 15 feet at least, so as to search the surrounding country and to screen any movements behind the enceinte. Some other obstacles might advantageously be placed beyond the ditch.

In places where water is available, the triangular profile will be preferred.

*Armament.*—The guns for direct fire will be on the ramparts, but will be under shelter till the last moment. They should consequently be light (4-inch and, exceptionally, 5-inch). They will have to fire on the troops assaulting the preceding line, as well as against columns attempting to assault the place itself. For flanking

purposes revolving cannon or machine-guns on parapet carriages, which will be supplemented by the fire of magazine rifles, whilst disappearing tourelles for Q.F. guns might with the same object be established at some distance from one another opposite the points of attack. For firing on the batteries, magazines, shelters, and strong points of the attack, guns of heavy calibre would be employed, simply hidden from view behind masks formed from trees and enclosures.

*Shelters.*—Only a very small amount of shelter will be provided, and that, quite proof, would be under the parapet of the flanks. The troops will be lodged in the town, or elsewhere. A straight line of railway on the ramparts will aid in transporting ammunition.

*Interior and Exterior Works.*—It will only be necessary to form a few ravelins without ditches to cover the gateways, and to form a covered-way along the counterscarp along the threatened fronts. Cavaliers or other interior retrenchments are out of the question, as they are easily destroyed from a distance. The same may be said of fighting in the streets, for the defenders of the barricades would not remain to be buried under the walls of the houses on either side brought down by the explosion of heavy projectiles. As formerly, the resistance may be prolonged by means of a *réduit* or new line formed of a single fort still untouched, or, preferably, of a group of forts placed in convenient positions (Belfort, Toul, Verdun, etc.).

#### TRANSFORMATION OF EXISTING FORTRESSES.

*Observations.*—Cases in which the new organisation of defences as described can be carried out will probably not occur in France for many years. On that account the study of how to transform existing fortresses has great importance on account of the practical interest it possesses.

#### I.—TRANSFORMATION OF THE LINE OF THE FORTS.

*Short Summary of the Transformation.*—The main object of the changes is to give to the line of defence an organisation similar to that which we have been studying.

With this view, since 1887, steps have been taken to disarm the forts, and to place the heavy artillery (*artillerie de combat*) in the intervals, with the exception of certain long-range pieces which would be used at the commencement of the struggle, and of pieces for the individual defence of the fort and for flanking the intervals. The fort should contain nothing, apart from workshops, but made up ammunition.

The garrison of the fort ought consequently to be reduced, calculated according to the number of pieces of ordnance and to the importance of the work.

It is allowed that one ought to construct *intermediate works* in all cases where the distance between the forts exceeds 3,000 yards; these works to contain flanking artillery and bomb-proof shelter for a small garrison.

Moreover, arrangements should be made for constructing infantry lines and batteries in the intervals, and for improving the communications generally.

*Transformation of the Forts.*—This transformation comprises the following :—The doing away with existing caponiers and with the escarp, with most of the traverses, and with certain store-rooms; the creation of a means of flanking the counterscarp, the thickening and transformation of the parapet and banquette, the improvement of those store-rooms that are retained, the creation of certain new shelters, and the installation of a few disappearing cupolas and flanking batteries.

As a general rule, all new shelters and walls are made in cement concrete, a material which also plays an important part in the strengthening of existing structures.

The counterscarp is always retained; if it is exposed to fire it is rebuilt in cement concrete, if not exposed, it is cut down to a height of about 16 feet, and then the earth above is removed for a thickness of 16 to 20 feet and replaced by



sand or shingle, the whole being faced with a covering of ordinary soil (*Fig. 1, Plate XXII.*).

The obstacle is further emphasised by palisading fixed on the escarp wall, the latter being very much, if not entirely, cut down. For escarps which have no revetment, a palisading alone suffices, altering at the same time the counterscarp as shown in *Fig. 2, Plate III.* The gorge escarp is treated like the counterscarp of front faces. From the fact that the fall of revetted or semi-detached escarps would probably bring down the earth above them, and so fill up the ditch, it is considered advisable to alter the profile as shown in *Fig. 2, Plate XXII.* In rocky ground the escarps and counterscarps may be retained, but it would then be advisable to crown the counterscarp with a good wrought palisading of 8 feet high, so as to prevent the placing of flying bridges.

*Flanking.*—The flanking is arranged for by counterscarp galleries, or chambers in concrete, which can be easily provided in the counterscarp opposite the former position of the caponiers, now removed. For the flanking of the gorge of works, steel caponiers should suffice. These caponiers, set in a mass of cement concrete, only project about  $2\frac{1}{2}$  feet from the escarp, and would be in two tiers, each  $5\frac{1}{2}$  feet high, with a quick-firing gun in each tier.

*Parapet.*—The parapet, which now becomes the true fighting parapet, always has a thickness of 33 to 40 feet. The artillery banquette is only arranged for light pieces.

The *traverses*, except for a few on the flanks, are cut down to the level of the crest-line; they are also separated from the infantry banquette, so as to ensure its continuity (*Fig. 3, Plate XXII.*). The shelters in the cut-down traverses are filled with broken stone or gravel. The *front faces* would only be armed with a few pieces placed behind the shelter of the lower parapet in forts with an elevated battery, and conversely in forts with a low battery. These pieces would be separated from one another by splinter-proofs 20 feet thick at least, and the different platforms would be connected by an open-air communication running along the whole of the crest. The rest of the parapet is arranged for infantry, with wide banquettes to take, if necessary, field guns. The flanks would have disappearing cupolas for Q.F. guns placed at the ends of the lower parapet.

*Flanking the Intervals.*—To flank the intervals, open-air batteries can be employed formed at the gorge of the fort, and hidden by the high relief of the other faces; increasing the value of this flanking by cupolas for two Q.F. guns at the junction of the flanks and the gorge. One might add, too, two 20-pounder guns mounted on a concrete platform, and protected by traverses. The cupolas might be economically replaced by concrete casemates covered by an orillon, but the field of fire would be narrowed.

*Shelters.*—These will be retained for the most part, but only those will be strengthened with concrete which are intended for the garrison proper; the others will do for putting up as many troops as possible during the investment period.

To render bomb-proof the existing shelters, they must be surrounded, even over the face, with a turtle-back of cement concrete 8 feet thick, placing between the old masonry and the concrete a cushion of 3 feet of sand (*Fig. 4, Plate XXII.*). In the case of buildings which face one another, it is advisable to cover over the court which separates them, and then to cover the whole with the sand and turtle-back of concrete. The casemates transformed in this manner can only receive artificial light and air. In order to gain direct access to the different rooms, one can substitute a series of arches leaning against the former face of the building, and forming an opening in front of each casemate, but the security is lessened (*Fig. 5, Plate XXII.*).

The strength of the old arches may be insufficient to support the addition of such a covering. It will then be necessary either to strengthen the present



# FORTIFICATION SINCE THE INTRODUCTION OF HIGH EXPLOSIVE SHELLS.

Fig. 1.

PLAN

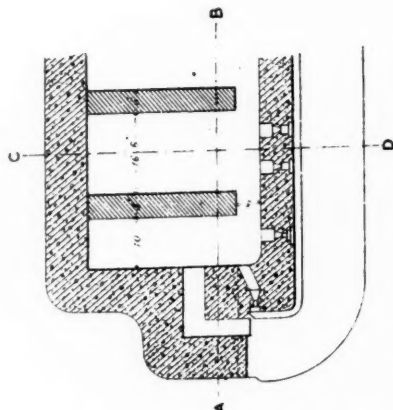
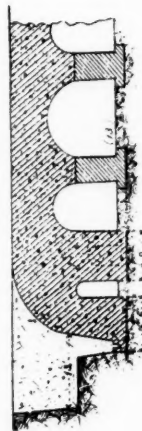
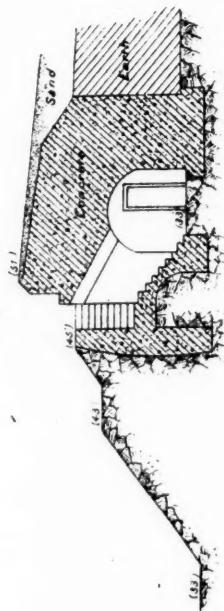


Fig. 2.

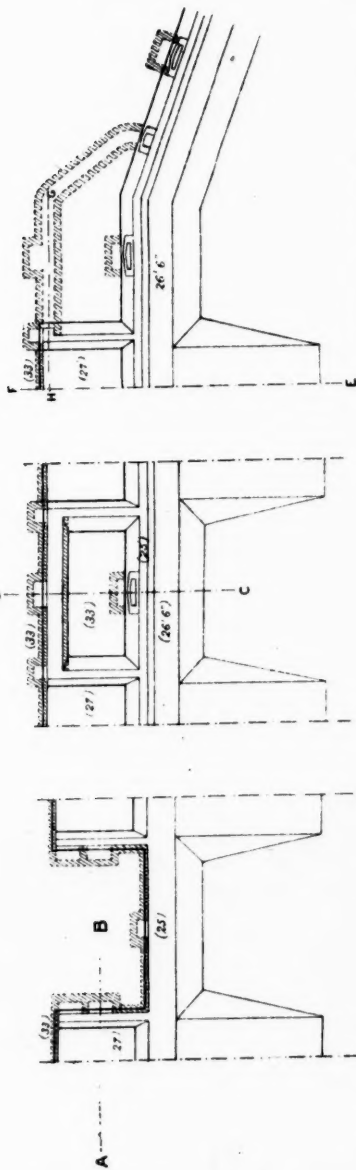


SECTION ON A-B

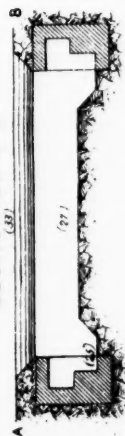


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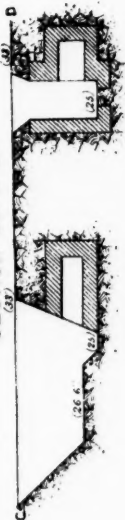
Fig. 3.



SECTION ON A-B



SECTION ON C-D



SECTION ON G-H



SECTION ON E-F



Fig. 1.

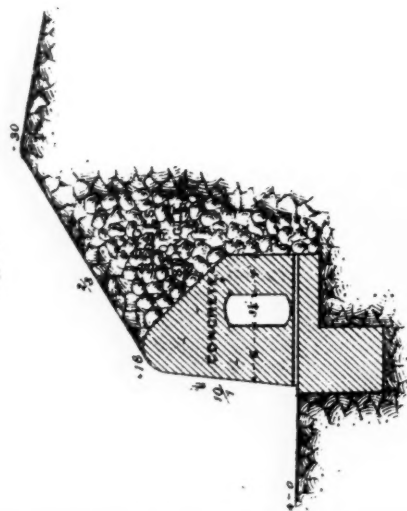


Fig. 2.

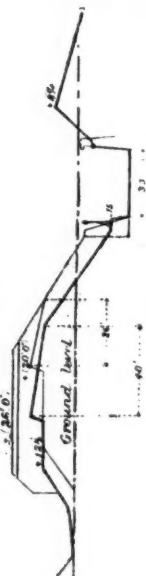


Fig. 4.

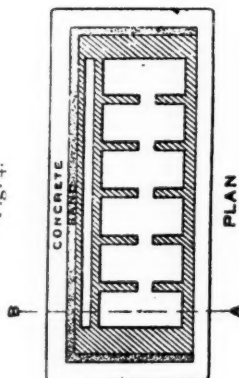


Fig. 3.



Fig. 5.

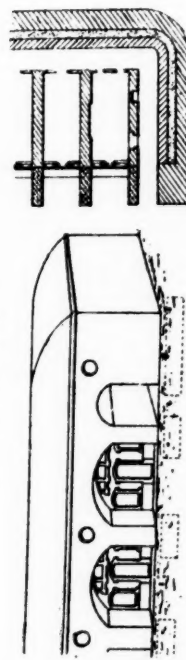
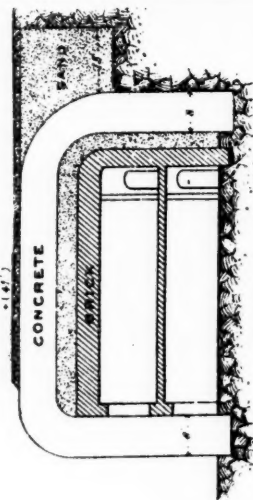


Fig. 7.



SECTION ON A-B



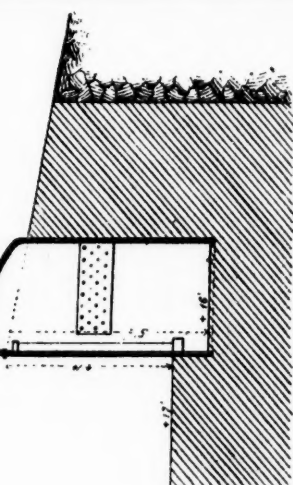


Fig. 6.

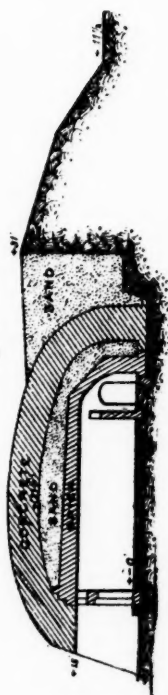
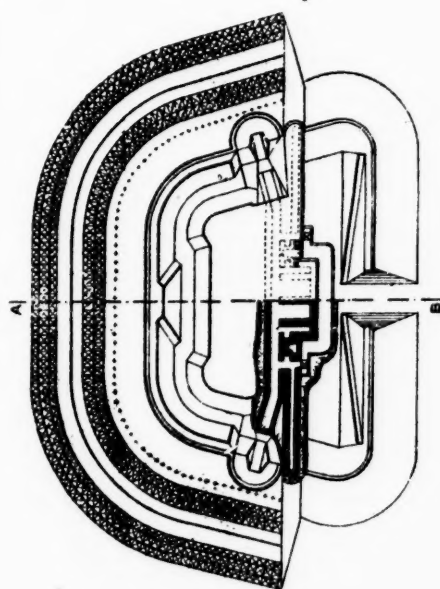


Fig. 8.







arches by means of second brick arches, or to arrange the concrete turtle-back on a cushion of sand arranged as a very flat arch (*Fig. 6, Plate XXII.*).

*Magazines and Communications.*—If it is impossible to form in the fort perfectly safe magazines, they must be placed under the glacis, communication with the fort being kept up by an underground passage. The communications, especially the entrance, will require special attention, and should ensure perfect security.

*Summary.*—This transformation of the existing shelters, always very costly, cannot be very satisfactory; and it will often be better to arrange for entirely new casemates, either in the interior of the fort, or under the glacis.

*Observatories.*—The installation of an armoured observatory will complete the transformation of the forts, which must be further surrounded by accessory defences, as previously described. This observatory will be in communication, electrical or otherwise, with the shelters, the piquet posts, and the flanking works (*Fig. 7, Plate XXII.*).

## II. INTERMEDIATE WORKS.

*General Arrangement.*—These works, sited on commanding points between the works, are intended to perfect the flanking of the intervals. They are generally arranged for a half-company of infantry, and are armed with two light pieces (revolving cannon or machine-guns) worked by infantry, who bring them up at the last moment on the crest of the flanks at points where the banquette is purposely widened.

Their *trace* is usually a demi-ellipse (*Fig. 8, Plate XXII.*), giving, on a calculation of 1 yard per man, a crest-line of about 120 yards in length. The profile might advantageously be of the triangular type, as this arrangement does away with the necessity of constructing flanking works for the ditch.

At the gorge is placed a shelter in concrete one story high, containing three chambers, each from 10 to 16 feet wide and 25 feet long, capable of holding two-thirds of the garrison. The interior height is 10 feet, the thickness of the concrete 8 feet, and of the cushion of earth 18 inches. A thickness of 13 feet of sand, in front of which is 26 feet of earth, protects the concrete in front and on the flanks.

On the gorge side the escarp wall, formed by the shelter, has a drop ditch in front of it 13 feet wide and 10 feet deep. The gorge ditch itself, practically straight, has a depth of 10 feet and length of about 33 feet, and is flanked by the jutting out of the shelter.

The communications consist of ramps sloping at  $\frac{1}{4}$ , starting from the bottom of the ditch. Access from the ditch to the concrete shelter can be maintained by crossing the drop ditch over a light wooden bridge.

*Infantry Lines.*—In front of the above works one would throw up, in war-time, in the front line of all, other works much like them, on the ridges (*crêtes militaires*). These would not have shelters of concrete, but only of rails and trees, proof against shrapnel and splinters of shells. In some frontier places it has been thought advisable to construct these works in peace-times.

*Final Arrangements.*—There remains the arranging in third line of *sunken and invisible batteries* behind the crests and on the reverse slopes, as has been before described.

Lastly, in fourth line would be *magazines* and *casemates* still further in rear, hidden by folds of the ground. Powder magazines, ammunition stores or workshops would be made as far as possible in caverns; the garrisons would be lodged in underground galleries, villages, barracks, or tents.

The different natures of communications must be at the same time improved as far as possible.

We do not touch on the transformation of the *second line (ligne de soutien)*, which would only be made at the last moment. The old *enceintes* would be modified on the same principles as those already enunciated.

INDIA.—It is much to be regretted that War Correspondents do not more frequently supply themselves before embarkation with some handy work on reconnaissance, which would recall to their minds the essential points an intelligent reader requires to be informed about, in order to appreciate correctly the actual services rendered by the troops engaged. Owing to the want of this class of information, it is exceedingly difficult for readers unacquainted with the theatre of operations to form any idea of the magnitude of the obstacles surmounted, or the services rendered by the forces engaged in the Chitral expedition.

We know that rivers have been bridged, mountain ranges traversed, etc., but a river may mean any stream of water from 5 yards wide up to 5,000, with a current of half-a-mile an hour to twenty and even more, and a pass may also vary within very wide limits of height and steepness. A few dimensions, even if only approximate, would have added infinitely to the value of the accounts received, and would not have destroyed the picturesqueness of style which the public are believed to admire.

It is deeply to be regretted that the *Times* correspondent was unable to arrive on the scene sooner. Judging by the account of the defence of Chitral, printed below, he appears to possess in a very marked degree the faculty of transmitting accurate information in the very smallest number of words practicable, and with it before us, it is possible to form a fairly reliable estimate of the rare skill and endurance shown by all ranks in the discharge of their duty. Considering the constitution of the garrison it is certainly one of the most noteworthy military feats of the present century.

"The work of the defence practically devolved upon three officers only—Captain Townshend and Lieutenants Gurdon and Harley. These three divided the day into watches as on board ship. Nominally they were on for four hours and off for eight, practically it was more nearly on for eight and off for four.

The Kashmir troops were brave, but the regiment is a new one. It was much depressed by severe losses in the action of March 3rd, especially by the death of General Baj Singh and Major Bhikran Singh, and, consequently, it required the close supervision of the British officers, most of which fell on Captain Townshend.

The garrison had supplies which, on short rations, would last till the middle of June, but for meat were reduced to eating horse flesh. The discipline, steadiness, and enthusiasm of the Sikhs were magnificent; on one occasion those in the hospital rushed out to take part in the defence, but even this evidence of enthusiastic bravery did not save them from a severe rating from their stern old native officer for disobedience to orders in leaving hospital.

The garrison began the defence of the fort under the depressing influences of the ineffectual action of March 3rd, and the besiegers started correspondingly elated.

Chitral Fort is 80 yards square, with walls 25 feet high and 8 feet thick; at each corner there is a tower about 20 feet higher than the wall, and outside the north face on the edge of the river is a fifth tower to guard the waterway; on the east face a garden runs out 140 yards, and 40 yards south-east of the south-east tower was a summer-house. On the north face and the west face were stables, etc., outside the walls. Long range fire, such as that from Martini rifles, commands the fort nearly all round, and Sniders are effective from many points. The fort is built of framework of wood filled in with stones. Without the wooden framework it would fall to pieces; hence the danger from fire. The siege commenced suddenly, so there was no time for the demolition of the outside buildings and walls beforehand.

Captain Townshend's first care was to begin demolition, and most of this had to be done under fire. There were large plane trees on two sides of the fort, but these he was unable to cut down. His other principal measures were:—First, the establishment of a fort police to prevent fire and to watch the Chitralis inside the fort; second, the making of sanitary arrangements for the whole place smelt

horribly, and there was great fear of disease; third, the organisation of fire parties, to assemble at any point on an alarm of fire; fourth, the organisation of officers' servants and troop followers for such work as demolition, carrying water, earth, etc. (these did splendid work and acted as courageously under fire as the Native soldiers did); fifth, forming a garrison for each separate part of the fort; sixth, the provision of every kind of head cover, such as traverses or paradoses erected from demolished buildings, boxes filled with earth, and sand bags; seventh, the concealment of doorways from view by means of carpets. Finally, he instilled into all that relief must come soon, though he had no information that it would.

The total number of persons in the fort was 543, of whom 460 were combatants; the remainder were servants, followers, Chitralis, and others. Of these combatants, ninety-nine were Sikhs and 361 Kashmir troops, but there were always from sixty to seventy in hospital. The garrison was disposed as follows:—Forty men to each parapet, ten men to the main guard gate, twenty as water picket, twenty-five to the water tower, twenty-five to the loopholed stables by the water tower, ten as water-gate guard, ten as guard over Chitralis, six as guard on ammunition, six to guard the garden door, twenty-four in the towers; total, 176; leaving, out of 342 rifles (excluding officers, etc.), 167 available for sallies. There being only this number available, Captain Townshend decided not to take up an active defence, and only to sally when necessary, or as soon as news of relief being at hand should be received. Of ammunition there were 350 rounds of Martini per man for the Sikhs and 280 rounds of Snider per man for the Kashmir Regiment.

The siege commenced on March 3rd, and on the 5th the enemy attacked the north-west tower and set fire to the water tower, but this was soon put out. On the 14th the enemy made an ineffectual attack on the waterway. Two days later there was a truce while Sher Afzul communicated news of Lieutenants Fowler and Edwardes. It appeared from communications made with Sher Afzul that that Prince was completely in the hands of Umra Khan's men. Lieutenants Fowler and Edwardes arrived on the 20th, but the garrison were not allowed to see them. On the 23rd the truce was brought to an end.

On the 29th a Union Jack, made in the fort, was hoisted. The enemy showed unusual activity on the 31st by creeping up to the fort, especially towards the waterway.

On April 7th the enemy attacked the north-west front in great numbers and threatened the waterway, but were repulsed by steady volleys from the towers and covered way. Meanwhile the enemy daringly ran in and lit a huge fire of fagots against the south-east tower, their riflemen keeping up a very hot fire all the time from the summer-house, only 40 yards distant. The tower took fire and blazed up. Mr. Robertson and six men were wounded in putting it out. After this extra precautions were taken against fire, and large heaps of earth were piled up on the walls. On the 8th the enemy again attacked and succeeded in setting fire to the same tower, but not seriously. Three days later the enemy unsuccessfully attacked the waterway, also the east face.

On the 17th Captain Townshend noticed that the enemy had been playing tom-toms in the summer-house for some time past, and it struck him it might be to drown the noise of mining; after careful listening, the faint sound of a pick was heard 10 feet from the south-east tower. Lieutenant Harley, with forty Sikhs and sixty Kashmir troops, was accordingly told off for a sally. They took 150 lbs. of gunpowder to blow up the mine when taken. The door of the garden gate on the east face was opened quietly, and the sally party rushed out with fixed bayonets. A few straggling shots, and the house was taken; thirty-five of the enemy were bayoneted as they came out of the mine. Powder-bags were laid, and the mine was blown up. Lieutenant Harley then hurried back, after a most successful sally. He lost eight men killed and thirteen wounded. The enemy lost about sixty men, nearly all killed. Captain Townshend then began a circular

countermine round the tower to protect it. On the 18th, at midnight, a man rushed up to the fort and shouted that the enemy had fled and that Colonel Kelly was two marches from Chitral.

The siege of forty-six days was over."

Since the above was in type, the Pioneer mail of April 18th has been received, and from the excellent letters supplied by their correspondent, in whose work it is easy to recognise the pen of a trained soldier, the following facts are extracted. In the storming of the Malakhand Pass the 3,000 men armed with the Lee-Metford consumed only 20,000 rounds of ammunition, showing fire discipline of the highest order. The three mountain batteries fired respectively: No. 3, 48 ring shell, 148 shrapnel; No. 8, 35 ring shell, 69 shrapnel; No. 2 (Derajat Native), 30 ring shell, 134 shrapnel. Sometimes the batteries opened fire at 4,000 yards, but it was between 2,400 and 1,300 that the best work was done. It was very noticeable throughout all the actions how rapidly the short bracket was obtained.

The charge of the squadron of the Guides on the 4th April was very much hindered by the deep going, nevertheless it must be pronounced an excellent piece of work.

The passage of the Swat River, on the 7th April, seems to have been a brilliant little feat of arms. Whilst the Bengal Sappers were constructing a bridge under fire, the 11th Bengal Lancers were led forward through boggy ground, intersected with innumerable small canals, and then sent in to ford the stream. "It was a fine sight to see this regiment, the best horsed in India, dash into the rapid stream, the water half way up to their saddle flaps. Directly the enemy realised the cavalry could approach they fled, but too late to save their skins. With shouts of delight the horsemen swept right and left, lancing the now demoralised foe."

The health of the men still continues excellent—out of a force of 15,000 all ranks, only 162 are on the sick list. The Gordon Highlanders have not a man in hospital, and the 13th Bengal Infantry and wing of the 34th Pioneers are equally fortunate.

With regard to the suffering from snow blindness, reported from the force under Colonel Kelly, it may be worth while to point out that the thinnest screen of yellow cotton, or silk, will effectually prevent it, and that a somewhat thicker layer of the same material, worn as a lining to helmet and coat, will render the most susceptible of men perfectly secure against the effects of direct solar radiation.

The *Graphic* of May 4th gives a useful sketch of the Chitral force, and the pictures showing native Pioneers cutting a pathway round the ice slopes may afford those who do not know the country some notion of the hardships and difficulties surmounted by Colonel Kelly's splendid little detachment.

**JAPAN.**—Accurate statistics of the amount of ammunition expended on either side during the past campaign are as yet unattainable. Still, it may be pointed out how completely the views of those who base their theories on the nature of the weapon, and not on that of the man, have been falsified.

That the Chinese fired as fast as their weapons permitted them seems incontestable, and many of these weapons were of the latest description. Yet the Japanese, attacking again and again across the open, have in the end only a loss of some 600 men killed to deplore—not 1 per cent. of the total engaged.

Suppose, for the sake of argument, that, yielding to the views of the makers of bullet-proof shields, the Japanese had provided each of their men with a 7-pound cuirass. How many lives at the outside would this protection have saved? Probably not more than 200. Then would it have been worth while to add to the infantry man's burdens another 7 lbs., in order to save him from this 3 per cent. risk? Is it not, on the contrary, far more probable that the exhaustion entailed by the additional weight would have led to more deaths on the line of march than the shield might have saved on the battle-field?"

UNITED STATES.—The annual report by Major-General Schofield, commanding the U.S. Army, contains matter of more than usual interest. The labour troubles of last year must ultimately compel the public to face a considerable increase in military expenditure, but, as in other countries, the public is averse to parting with its money, and very plain speaking is required from the authorities to overcome this resistance.

This plain speaking the Major-General Commanding does not spare them, and his report summarises the position so clearly and contains so many points deserving the closest thinking out, that we print the main headings below almost *in extenso* :—

"It is certainly manifest that the present condition of the country, with a population of nearly seventy millions, under the danger of disorder now known to exist, cannot be met by the same force that was deemed adequate twenty-five years ago. One man to fourteen square miles of territory, or one man to 2,800 of population, is surely a very small guard to protect property and prevent violation of law, leaving out of consideration the force necessary to guard the extended sea coast against attack by a foreign enemy.

"It is also worthy of remark that more than once in the last summer an infuriated mob in a single city was twice as formidable in numbers, and capable of doing vastly greater injury to the country than any combination of Indian warriors that ever confronted the Army in this country.

"It seems clear, therefore, that the effective strength of the Army should now be considerably increased. This can be done at a very small comparative increase in cost. The present regimental organisations need not be largely increased. Two additional regiments of artillery for the necessary sea coast defence, two additional regiments of cavalry to patrol the long lines of railway under Government protection, and the present twenty-five regiments of infantry, converted into three-battalion organisations, would, it is believed, be a just and conservative estimate of what is now actually needed. For this the existing number of commissioned officers is nearly sufficient. But a considerable permanent increase in the enlisted strength of the Army should be made, and a still further increase authorised, to be made by the President, when, in his judgment, an emergency requiring it may be reasonably foreseen. Such disorders as those which have affected the country during the past summer do not come suddenly or unexpectedly. Intelligent observers fully justified the prediction of such troubles a year before they appeared. Coincident with the first indication of coming disorder was a diminution of industrial employment, by which large numbers of honest and faithful labourers were deprived of their accustomed work, and hence sought enlistment in the Army. These men could not be received, because of the limit fixed by law upon the enlisted strength of the Army. These men, applicants for enlistment during the first eight or ten months, were not the kind of men who participate in the operations of a lawless mob; they were simply honest labourers who could no longer obtain employment in civil life, and hence sought it in the Army. If authority had existed by which the President could have received a few thousand of these men into the ranks, they would have become well-disciplined, reliable soldiers by the time they were called out to suppress mob violence.

"It is not a good military system in which the executive has no authority whatever to increase the effective strength of the Army in time of need, but must await the slow process of legislation for that purpose.

"The organisation being fixed by law, with maximum and minimum limits of strength, the executive should be authorised to vary the enlisted strength between those limits, according to his estimates of the necessities of the country.

"The cost of the suggested increase in the Army would be utterly insignificant, as compared with the damage that might have been done in a single day in one city, if the military force assembled had proved inadequate."

Passing on to the need of preparation to meet foreign aggressors, he says :—

"The relation of the United States to the great Military Powers of Europe now exhibits a far greater disparity in respect to preparation for war than that which has existed between China and Japan. \* \* \* The Atlantic Ocean is, under modern conditions, little more serious an obstacle to the navies and transports of Europe, than are the Japan and Yellow Seas to those of Japan.

"The time has, therefore, fully come when the people of the United States should dismiss the confidence born of past experience, and look the future fairly in the face. The more especially is this the fact, in respect to the extended sea coasts of the country, and the broad oceans where the interests of the United States must be defended and protected, if this country is to continue to be a first-rate nation."

## FOREIGN PERIODICALS.

### NAVAL.

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens*.—No. 5. Pola and Vienna: May, 1895.—"Maritime War and Naval Warfare." "Foreign Navies in the Year 1894." "The new Elswick 8-inch Q.F. Gun" (with plates). "The new French Coast-defence Battle-ships 'Bouvines' and 'Jemmapes'" (with photographs). "The Building Cost of the present French Fleet." "The new French Armoured Cruiser 'Dupuy-de-Lôme.'" "The English Naval Estimates for 1895." "Naval Notes: Italy, Turkey, United States, and Argentine Republic." "Description of new Gas-Engine for Boats." "Notices of Books."

FRANCE.—*Revue Maritime et Coloniale*.—Paris: May, 1895.—Not been received up to going to press.

*Le Yacht*.—Paris: 6th April, 1895.—"The Colonial Army and the Marine Artillery" (E. Weyl). "Yachting News." "Electricity, Arc Lamps." "Steamboats, Burning Petroleum and with Multitubular Boilers." "The Racing Yacht 'Red Lancer.'" "The new Coast-defence Battle-ship 'Bouvines' (with photograph). "Naval Notes, Home and Foreign." 13th April.—"The Navy in the Senate" (E. Weyl). "Yachting News." "The Madagascar Gun-boats." "The Cadres-Law." "The new Austrian Cruiser 'Maria Theresia.'" "Naval Notes, Home and Foreign." "The Naval Technical Association." 20th April.—"The Operations at Wei-Hai-Wei" (E. Weyl), with map. "Yachting News and Notes." "The German Battle-ship 'Wörth'" (with photograph). "The Examinations for the Merchant Navy: the Decree of 10th April, 1895." "Naval Notes, Home and Foreign." "The Naval Technical Association: Discussion on Ship's Guns." "Notices of Books." 27th April.—"The Peace between China and Japan" (E. Weyl). "Yachting News and Notes." "The French Maritime Fisheries." "The President of the Republic at Havre" (with photographs of the "Jean-Bart" and "Australia"). "Trials of the 'Friant.'" "Naval Notes, Home and Foreign."

*Le Moniteur de la Flotte*. Paris: 6th April, 1895.—"The Law of the Cadres" (Marc Landry). "The Report of M. Barbey on the Budget of the Navy." "Madagascar and Colonial News." "The Budget or the Navy in the Senate." "Naval Notes, Home and Foreign." "Official Announcements." 13th April.—"More on Ship's Lights at Sea" (Marc Landry). "Madagascar." "A Colonial Medal." "The War between China and Japan." "Naval Notes, Home and Foreign." "Official Announcements." 20th April.—"Some Reflections on the New Law regulating the Cadres" (Marc Landry). "Madagascar and Colonial Notes." "The Peace between China and Japan." "The Protection of Light-houses and Semaphores." "Naval Notes, Home and Foreign." "Official Announcements." 27th April.—"An Historical Point" (Marc Landry). "The Journey of the President of the Republic." "Madagascar." "Naval Notes, Home and Foreign." "Official Announcements."



*La Marine Française.* Paris: 10th April, 1895.—“Paris, thirty-six hours from Algiers,” with chart (Paul Fontin). “The Infantry of the Marine.” “The actual state of English opinion on Naval Tactics.” “The Discussion on the Naval Budget.” “The Defence of the Coasts and the Navy.” “Yachting Notes.” “Naval Notes, Home and Foreign.” 25th April.—“The Discussion on the Budget of the Navy.” “The Cadres of Officers” (Rear-Admiral Réveillère). “The Defence of the Coasts and the Navy” (*concluded*). “Lights carried by Steamers at Sea” (*concluded*). “The Canal from Marseilles to the Rhone.” “Yachting News.” “The Geographical and Colonial Movement.”

GERMANY.—*Marine Rundschau.* Berlin: May, 1895.—“The Rise and Historical Development of the Naval-Officer’s Profession from the Middle Ages to the Present Time.” “A Voyage to the East-Indies in 1751.” “Trials of the New Cruiser ‘Gefion’” (with photograph). “Results of the Trials of the New Fourth Class Battle-ships ‘Hildebrand,’ ‘Heimdall,’ and ‘Hagen.’” “On the Methods of Preventing Vibrations in Steamers.” “Naval Notes, Foreign.” “Notices of Books.”

ITALY.—*Rivista Marittima.* Rome: April, 1895.—“English Coal in Italy” (A. Teso). “On the Application of Dynamometers to all Marine Motors” (with plates). “On Yachting” (with plates). “Naval Strategy” (D. Bonamico) (*continued*). “The Navy of Cosimo I. and his Immediate Successors.” “The Question of Madagascar” (*concluded*). “Photograph of the Memorial Raised to the Memory of the Padre Alberto Guglielmotti by the Officers of the Navy.” “Naval Notes: Brazil, France, England, Germany, Russia, and Spain.” “Artillery and Explosives: Trials in the United States of Shells.” “Notices of Books.”

RUSSIA.—*Morskoi Sbornik.* St. Petersburg: February, 1895.—“New Uniform Regulations for Classes of Petty-Officers of the Fleet.” “Regulations for the Harbour School at Cronstadt.” “The Statutes of the Cronstadt Naval Club.” “On the Question of Cruiser-Warfare.” “The Boiler-Question in the Navy.” March, 1895.—“The Hydrographical Work in the Arctic Ocean in 1894.” “On the Question of Cruiser-Warfare.” “On the Building of Torpedo-boats out of Steel and Wood.”

SPAIN.—*Revista General de Marina.* Madrid: April, 1895.—“A Treatise on the Chino-Japanese War” (*concluded*). “The Naval Battle of Haizang” (with plans). “Electric Projectors.” “A National Misfortune: the Loss of the ‘Reina-Regente.’” “Compensation of Magnetic Declinations in the Iberian Peninsula.” “The New Gun-boat ‘Queros.’” “Naval Foreign Notes.” “Notices of Books.”

SWEDEN.—*Tidskrift i Sjöväsendet.* Carlscrona, No. 2.—“The Year’s Report on Shipbuilding.” “Naval Warfare by Colomb and Mahan.” “The Fleet in the Past Year” (*continued*). “The War between China and Japan” (*continued*). “On the Question of Search-Lights.” “On Maritime Law.”

## MILITARY.

AUSTRIA.—*Organ der Militär-wissenschaftlichen Vereine.* No. 4.—“The Theoretical Training of Officers and Cadets.” “Recent Improvements in Photography, and in the Reproduction of Illustrations,” etc.

*Mittheilungen über Gegenstände des Artillerie- und Geniewesens.* No. 4.—“The Employment of the Technical Troops in the Manœuvres of 1894.” “The French Fortress Artillery” (with plates); a careful and instructive compilation, worth study. “The Automatic Aiming Apparatus of M. Deport” (with plate); deserves the attention of specialists. “Book Notices,” etc.



FRANCE.—*Revue de Cavalerie*. April.—"The Instruction and Leading of Cavalry"; translation from the German of General Pelet Narbonne's new work; the original, it may be added, is one of the most fascinating books on the Arm yet published. "Operations of the 5th German Cavalry Division from the 12th to 15th August, 1870" (*continuation*); painstaking, but tedious. "The Food and the Work of the Military Horse," by Veterinary-Surgeon Dr. Rigollat. "Cavalry *versus* Cavalry"; the Service of Exploration; interesting. "How to make a Cavalry Soldier in the Shortest Time Possible"; Practical Hints on the Training of the Recruit; worth reading. "The Paces of the Horse Experimentally Investigated."

*Revue du Cercle Militaire*. 6th April.—"Recruiting in England"; runs through the whole month; very moderate, and fair in tone. "Madagascar." "The 13th Corps in 1870." "The Spaniards in Cuba"; an interesting study of the special conditions under which Marshal Campos is operating. 13th April.—Same articles continued. 20th April.—"A Folding Bicycle"; description of a bicycle jointed between the wheels, which can be folded up and carried on a man's back where circumstances of ground prevent the bicycle carrying the man; illustrated with sketches. 27th April.—"A Chat about Ballooning." "The Folding Bicycle" (*continued*).

*Revue Militaire Suisse*. April.—"A Battle in the Alps nineteen centuries Ago." "The rôle of Cavalry," according to the regulations of August, 1894. "The Chino-Japanese War." "The Federal Constitution," and the proposed new military organisation. "The Defences of the Furka, and the New Road Up the Grimsel." "Notes," etc.

*Revue d'Artillerie*. April.—"The Austrian Field-Artillery Practice Regulations." "Note on a Moving Target on Wheels," worth trying. "The French Artillery Corps," an historical study; promises to be interesting. "Repeating Pistols," Borchardt's patent; well worth attention. "Notes," etc.

*Le Spectateur Militaire*. 15th April.—"Modern Engines of Destruction." "Hygienic Reform in Our Barracks"; worth reading, exposing relentlessly the false economy of neglecting sanitary considerations. "The Army Estimates for 1895"; should be read by specialists. May 1st.—"Marshal Saint Arnaud in the Crimea," compare Dr. Russell's recent Great War in the Crimea. "Hygienic Reform in our Barracks" (*continued*). "The Army Estimates for 1895" (*continued*). "Book Notices," etc.

*Revue Militaire de l'Étranger*. April.—"The German Army Estimates for Manœuvres and Training, 1895-6." "The Chino-Japanese War." "Russian Infantry Reserve Formations in 1895." "The Attack of Coast Defences," according to British expert opinion. "Notes," etc.

*Journal des Sciences Militaires*. April.—"Fighting Strategy," by General Lewal; a remarkable, powerfully-written article, pointing out how modifications in modern weapons literally decree the offensive. "Sinicae Res," the ultimate consequences of the Chino-Japanese War. "The 'Cadres' of the Reserve and Territorial Armies," by General Phillebert. "The Campaign of 1814," by M. Weyl. "General Principles of Plans of Campaign," readable. "Cryptographie," by Captain Valerio; an exceedingly interesting article on deciphering despatches. "The French Army in 1690." "Book Notices," etc.

*L'Avenir Militaire*. 2nd April.—"The new Balance of Power in the East"; attempt to predict the consequences of the Japanese successes. "Conscripts Rejected on the grounds of ill-health"; a letter from a military surgeon on the results of malingering as nowadays practised in France. "False News and National Defence"; an appeal to the patriotism of newspaper proprietors. "The Army in Parliament." "Madagascar." 5th April.—"The Promotion of Officers," by General Cosseron de Villenoisy, worth reading. "The Colonial Army"; it appears that when last year the Army was called on for 3,500 volunteers for the Marines, only 2,500 came forward. "Article 21 on the Law of Recruiting."

"The Army Estimates." 9th April.—"Cuba." "The Expenses of a European War"; well worth study, see Military Notes. "The Infantry Tunic"; refers to the clothing accounts. "The Army in Parliament." 11th April.—"The Politics of the Hova's"; warns against the tendency to underrate the enemy's intelligence, too common in the French Press. "Messers for N.C.O's"; should be read. "The Leisure of our Soldiers"; from the *Soleil*, pleads for intellectual recreation for the Soldier when off duty; worth reading. "The Death-rate in the French Army"; report of General Zurlinden; shows a progressive improvement following the provision of pure water supply. "Supply in Colonial Campaigns"; review of a new work by Ned Moll. 16th April.—"Lettres à Fanette"; a review by General Cosseron de Villenois of a recent semi-humorous book with the above title, exposing the weak points of the French Cavalry organisation. "The Re-organisation of the Ottoman Army"; worth reading. "The Gun-boats for Madagascar and the Brinkburn." 19th April.—"The Tactics of the Offensive" (infantry); nothing new. "Old Rifles and New Cartridges"; on Hebler bullets applied to Gras rifles. "Gifts to the Troops in Madagascar." 23rd April.—"The German Army and its Recent Progress"; review of an article in the *Nouvelle Revue*, well worth reading. "Chinese and Japanese." "The Hygiene of the Soldier." "Drink in the Army." 26th April.—"Japan and Europe." "The Promotion of Veterinary Officers." "Trop d'Unités"; more about "Lettres à Fanette," lamenting the numbers of employed men in the Field Batteries. 30th April.—"Europe and Japan." "Question de Droit"; deals with the differences between the promises of the Military Law and its working in practice as regards the provision of work for ex-N.C.O's.

GERMANY.—*Militär-Wochenblatt*. 6th April.—"An Ideal Staff College." April 10th.—"Five Letters of Gneisenau's, from the years 1813-16-24 (communicated by Max Leman). "An Ideal Staff College" (*continued*). "Rocks Ahead for Discipline"; sensible article on the danger of the spread of Socialistic theories. 13th April.—"Fillis, Plinzner, and our Riding Regulations"; an exceedingly interesting summing-up of the controversy between the above-mentioned horsemen and the Prussian Riding Regulations. "The Influence of Sea Power on History"; review of Captain Mahan's work. 20th April.—"Kriegslehren"; review of General von Scherff's book by Major-General Keim; worth reading; the two are well-known adversaries. "Railways in Eastern Asia." "The use of Tents in Winter"; summary of experiments during the past year. 24th April.—"New Field Guns by Foreign Firms"; short summary of recent progress. "How to Increase the Mobility of Field Artillery"; recommends the employment of spring draw bars. "Service on the Lines of Communication." 27th April.—"Cavalry Divisions in Peace." "The Mobility of Field Artillery." "Mounted Orderlies for the Infantry."

*Supplement to the Militär-Wochenblatt*. No. 2.—"The Training, Leading, and Employment of Cavalry," lecture before the Military Society of Berlin, by Major-General von Bissing. No. 3.—"The Evolution of Our Infantry Tactics Since the Last Wars," lecture delivered at Karlsruhe by Major-General von Janson. "Field-firing of Artillery and Infantry," by Major-General Rohne, 8th Field Artillery Brigade; very interesting; compare with Major Hughes's lecture on Field Artillery in this number.

*Deutsche Heeres Zeitung*. 3rd April.—"Practical Instruction in Field Service for Infantry and Cavalry"; a readable article, suggesting many ways of utilising maps and the blackboard for indoor teaching. "Modern Fighting Formations before the Judgment Seat of the New Weapons"; a tactical psychological study, worth reading; strongly condemns the want of control in the existing fighting lines. 6th April.—"Formation of Permanent Brigade-Division Commands in the Russian Artillery"; an important step in advance. "Modern Fighting Formations" (*continued*); the writer's alternative proposals will hardly commend

themselves to practical soldiers. 10th April.—"The Railway for Madagascar"; criticism of a paper on this subject in the *Journal des Travaux Publics*, in which it is stated that 500 untrained labourers can lay six kilometres of line a day; this scarcely agrees with British or American experience. "Militärische Zeitstudie über Formen und Wesen, Wissen, Können, und Sein" (untranslatable); a powerfully-written appeal for free discussion in military matters. 13th April.—"The new Dress Regulations for officers." 17th April.—"General Vogel von Falckenstein." 24th April.—"Thirty Years Ago." 20th April.—"The Spring Promotions in the Russian Army." 27th April.—"The Main Campaign, 1876"; review of Hoenig's work.

*Jahrbücher für die deutsche Armee und Marine.* May.—"Friedrich von Hellwig and his Raids"; a study of partisan warfare between the years 1792 and 1814. "The Capture of Bonn by the Elector Frederic the III. of Brandenburg." "The English Cavalry Manœuvres of 1894"; *précis* of the *Times* articles. "The Italian Army and Fleet in the latter half of 1894"; worth reading. "The Austrian Occupation of Montenegro." "Military Notes from Russia"; always well worth study. "Comments on Hoenig's new work, 'The Main Campaign, 1866.'" "Book Notices," etc.

*Neue Militärische Blätter.* April.—"The Suez Canal and its importance for the peace of the world"; an article founded on misconceptions, but well worth reading, as indicating the bent of Continental military opinion; the maintenance of peace does not depend on what we know, but on what our possible enemies may think. "The Defence of the Shipka Pass"; a study; nothing new. "The Battle off the Yalu." "The Military Political Importance of Central America," by Otto Wachs. "The Reserve and Territorial Officers in France." "The War in East Asia." "Notes on Muskets, Rifles, etc." "Letters from France, Russia, and Italy"; these letters are always full of interesting matter.

UNITED STATES.—*The United Service.* May.—"Detached Service," not an essay on outpost and security services as the title suggests, but well worth reading all the same. Human nature is a singularly constant quantity. "Uniform," also, is neither hygienic nor red-tape, but will interest the reader. "Origin and developments of Steam Navigation," by Rear-Admiral George H. Prebles, U.S.N. "Which was the Thief?" the story of a reservation. "The Supply of the Armies of Frederick the Great and Napoleon," translation from the French; worth reading.

## NOTICES OF BOOKS.

*The Defence of Plevna, 1877.* By W. V. HERBERT. London: Longman & Co. Price, 18s.

About one hundred years ago, all Continental armies stood much on the same footing: they were recruited from the same class, drilled on the same lines, carried the same arms, and marched and manœuvred on much the same system. When, therefore, they encountered one another, the result generally depended on numbers only, and hence it came to pass that the capacity of uniting the greatest numerical superiority on the decisive point became the criterion of the leaders' ability. Not always though, for from time to time some great commander would arise who recognised that it was not the mere number of muskets that could be brought into line at the critical moment that signified, but the quality and discipline of the men who held them; and such commanders had an awkward habit of devoting the principal amount of their time and energies to the training of their men for fighting—a habit which frequently upset the preconceived ideas of cabinet politicians in a most unpleasant manner. Unfortunately for the art of war, these commanders

were generally too occupied with affairs of state to write their own memoirs, and this task usually devolved on men of less genius, without the proper training to appreciate rightly the events they chronicled; and these, in accordance with the scientific tendency of the age, endeavoured to simplify the matter down to the level of the lowest intelligence. They left out all considerations of the quality of the forces engaged, of the system for transmitting orders, etc., and judged the merits of the rival commanders simply and solely by the numerical forces brought on to, or within striking distance of, the battle-field. Other writers took their cue from these first performers, and even now—years after the conditions to which these ideas strictly applied have ceased to exist—we find them still retaining vitality in the schools and colleges of nearly the whole civilised world. These views have never been very popular amongst the regimental officers of our own Army, more particularly amongst those who have seen service; somehow or other the reflection would obtrude itself on their minds that the personal element in the men who stood behind the guns or muskets had a great deal more to do with the decision of an action than the mere question of numbers. And with the records of Inkermann, and many an Indian fight before us, who can say that they were wrong? But the unfortunate part of the matter was that the educational department of our Service remained under the ban of old-fashioned ideas, and the men whose sound common sense and experience prevented them from swallowing wholesale the tactical nostrums of our schoolmen found themselves outclassed in examinations by those who had, let us put it mildly, greater adaptability and less experience. It is this fact that has rendered military study and reflection so supremely distasteful to the average British officer, this, and not a want of real interest in his work, or even, as has been frequently alleged, a want of brain power. The average officer simply will not read what his common sense and experience shows him to be an inadequate explanation of the recorded events, for he knows and feels the importance that the personal element must play in any human conflict, and this is precisely the point that the text books invariably overlook; but give him something with the human interest strongly marked in it, whether it be some record of the past or suggestions for training men for the future, and he will greedily devour it. The popularity of Prince Hohenlohe's works, and of pamphlets such as the "Summer-night's Dream," etc., is sufficient proof of our contention.

Until now information of this character about the Russo-Turkish War, in English, or from English sources, has been almost non-existent, for few of the works written by the Russian officers have ever been translated; the Turks have given us practically nothing; and the newspaper correspondents were too deeply imbued with the old traditions, and too little acquainted, for the most part, with the needs and requirements of the men in the ranks to afford us much assistance.

This gap in our literature has been at length filled, and in the most satisfactory manner by Mr. W. V. Herbert in his "Defence of Plevna, 1877," a work which we can most sincerely recommend to officers of every rank throughout the Service.

Mr. Herbert enlisted in the Turkish Army during the Spring of 1877, received his commission as a Lieutenant in a battalion of infantry forming part of Osman's army at Widdin, and from thence marched to Plevna, and took part in every battle round that place until the final surrender.

Of English parents, he had been educated in Germany and placed in a German merchant's office, but the work proved exceedingly distasteful to him; and when the Servian war broke out he endeavoured to obtain his father's permission to join the Turks, but was refused on the grounds that his ignorance of the language must prove a fatal bar to his advancement. This defect in his education he at once set about to remedy, and thus when in the following year war between Russia and Turkey became inevitable, he renewed his request, and his father rightly judging that a boy of eighteen who showed so much grit and

determination was likely to fall on his feet anywhere, withdrew his opposition and allowed him to set out; unlike most parents, not only with the conventional blessing, but with adequate means for his purpose, and as many introductions as could be obtained for him. Armed with these he had little difficulty in securing acceptance as a recruit with the understanding that, if he showed himself attentive to his new duties he should be allowed to attend the Officers' School, and be gazetted as soon as his education was completed.

As a private soldier he lived for some weeks in barracks with the men, and of the treatment he received from his comrades and superiors he speaks in the very highest terms: the accommodation was clean, the food good, and the men courteous and forbearing in their manner towards one another; drunkenness being unknown, there was no crime, and but for the prevalence of the particular vice common to all Eastern races, no possible fault could have been found with them.

He was not long in satisfying the authorities of his fitness for promotion, and in a few weeks he joined the War School. His chapter on the education at that establishment deserves study, not alone for the clear account he gives of the system pursued, but also for the common sense which characterises his comments, one of which deserves transcription: "The silly system of marking in examinations is not known in Turkey. As in Germany, a candidate's knowledge of a subject was either sufficient or insufficient: if the former, he passed; if the latter, he did not. That is sound logic, and is sensible, simple, and practicable."

Within three weeks his knowledge was adjudged to be adequate. He was immediately posted to a regiment, then at Widdin, and directed to proceed to it in charge of a draft of 180 men.

So far, but for the unusual nature of his experiences, there is nothing to differentiate the book from any other military memoir; but now the originality of the author begins to disclose itself. Instead of passing over the life in camp and on the march, without reference to the daily tasks performed, he tells us day for day the difficulties encountered, and how they were overcome, and in doing so gradually introduces one to the men of his company, till one gets to know them as living entities. These details may seem small and trivial to some persons, but we do not find them so, for without this introduction the succeeding portion of the work, in which the great struggles they went through shoulder to shoulder are related, would not possess either the interest or the instructional value, we do not hesitate to ascribe to them. All through the summer the troops of Osman's army lay inactive in Widdin, but the time was not wasted as regards their preparation for the coming struggles. Hard practical drilling and manœuvring consumed the bulk of the time every day, and the interior economy of the companies was worked up to the highest pitch, special attention being devoted to the preparation of the men's feet for marching—a forethought that had its due reward.

At length, on the evening of the 12th July, marching orders were issued. Nineteen battalions, six squadrons, and fifty-four guns were to move eastwards on Nikopolis. Early on the 13th they moved off, but on the way news of the passage of the Balkans by Gourko, and of the fall of Nikopolis reached them, and the direction of the march was changed on Plevna; little did the men in the ranks realise what that name implied for them. It had been hard marching before, now the pace was doubled, and the difficulties to be overcome many times increased. The road led through an almost waterless district, the heat was tremendous, and had it not been for the forethought of the Mushir, who had sent on parties ahead to lay down watering facilities, it must remain doubtful whether the troops could have arrived in time. All officers should study this chapter, for rarely do we find the hardships inseparable from forced marching more graphically and more truthfully described, the staff officer may learn from it how the sufferings of the men may be reduced by timely pre-arrangement; and the young officer, the amount of determination and grit required to surmount such difficulties and endure such suffering.

On the 19th, the column marched into Plevna, having covered 115 miles in seven days, with ten deaths from exhaustion, and 10 per cent. of invalids all told, mostly footsore: "the feet of some men were one ghastly wound, several on removing their socks tore off both skin and flesh." Herbert's battalion had been in the rearguard, suffering all the usual inconveniences that attach to that position, but on arrival in camp, they found that their comrades of the other battalion had secured them quarters, drawn and cooked their rations, and made everything ready for their reception. But though on rearguard all day, they had to supply a strong picket for the night, and if the bulk of the company got six hours' clear rest a great many men had to go with less. Next morning they moved out to occupy their position on the left flank of the line. The part actually played by his company in the action was not remarkable, but his account of his first experiences under fire are worth noting. They beat off one Russian attack, the men exhibiting all the usual phenomena of this experience, for most of them had not as yet seen an enemy; some became wildly excited, firing rapidly without attempting to aim, others, often the worst performers at the targets, covering their men deliberately before pulling the trigger. Having repulsed the attack, they were withdrawn by order to meet a second and wider turning movement, which they again beat off, and then finally took part in the counter-attack which disposed of the Russians for that day, the enemy throwing away arms, coats, caps, even boots, to get away faster. Ultimately, his company got back to its quarters, after seven days' marching and an eighth of fighting; all ranks were thoroughly worn out, falling asleep in the ranks as they awaited the command to dismiss, but rest and food soon brought them round again, and presently they were hard at work with the rest preparing those earthworks which were to make Plevna so famous.

Of the remainder of the work it is impossible to give any adequate summary, for not a page of it can be skipped. Still, two incidents deserve special attention. In the battle of July the 30th, there occurred the exceedingly unusual, indeed we believe unprecedented, incident of two lines of infantry charging each other and actually meeting at full speed. We give it in our author's own words:—

"The Russian troops commenced to move. When they were within easy range we hailed them with a quickfire of two or three minutes' duration. I noticed deep gaps in their line, which were promptly filled up. They were allowed to approach as far as the foot of the hill. Then one bugle sounded the 'Charge'; a dozen others responded; the bayonets were lowered; the long line commenced to move, first slowly, then with increasing velocity, the efforts of all officers being directed towards the maintenance of a straight line. Down the slope we rushed, Talahet Bey (A.D.C.) leading with admirable bravery and devotion. Nearer and nearer we came; we heard the Russians' 'Hurrah'; wild cries of 'Allah' were started, drowning all individual voices; commands became useless.

"Now only a few hundred paces between the charging lines—they up-hill, we down—and at last there was a collision like that between two railway trains. A chaos of stabbing, clubbing, hacking, clutching, shouting, cursing, screaming men; knots of two or three on the ground, still fighting and clinging to one another in their death agonies; above the surging mass of heads the butt-ends of rifles, rising, falling like the cranks of numberless overheated engines; the mounted men with swords working at lightning speed; the colours bravely leading the way. As to my personal experiences, I remember nothing. All I know is that I discharged the six chambers of my revolver, but at whom I have no notion, and that my sabre was stained with blood. Then suddenly we looked at one another in blank surprise, for the Russians had gone, save those on the ground, and we were among friends, all frantic, breathless, and perspiring. The next thing I remember was the bugle sound 'Fire,' and we sped the retreating enemy with volley upon volley. Then the A.D.C. rode up and shouted to me to re-form my company, as the Russians would, undoubtedly, return to the charge."

Subsequently he mentions many occasions in the attack and defence of



entrenchments in which hand-to-hand encounters occurred, and in one of which he was himself cut over by a Russian mounted officer, who, leading his men, cleared the Turkish trench and fell dead well inside it; but of two lines rushing like cavalry to meet another we find no other mention, neither can we recall one in the whole of our military reading.

The other incident alluded to above, is the description of the final sortie of the 10th December. It is too long for reproduction here, even if one felt equal to the task; but it is told with such deep pathos, with such concentrated energy, in such simple language, yet so terrible in its meaning, that the whole scene is impressed on the reader's mind with a vividness that even Kipling could not surpass. A more heroic effort was surely never witnessed. There was no hope of victory to support them, only the certainty of death and defeat, as they silently formed up in the grey coldness of that bitter December morning. Yet at the first rush the long line swept right over the enemy's first line of entrenchments, bayoneting its occupants, then rallied, re-formed, and went at them again; but then the weight of overpowering numbers began to tell, and after a final struggle the survivors laid down their arms.

History records the surrender of many an army in the field, but as yet we have come across no instance in which the defeated force so brilliantly vindicated their soldiers' honour.

*La Vie de Planat de la Faye.* Paris: Paul Ollendorff, 1895.

Entrusted by the widow of one of the orderly officers of Napoleon I. with a collection of letters, annotated by herself, M. Vallery-Radot has produced a work likely to prove of considerable interest. As we conceive M. Planat de la Faye to be an absolutely unknown person to students of the history of Napoleon's time, we may well commence this notice by reciting a codicil in the Emperor's will, written at St. Helena in 1821, which is quoted in these memoirs as a proof that Planat's relations with him were of an intimate kind:—"Je lègue quarante mille francs à Planat, mon officier d'ordonnance."

In no history of Napoleon's campaigns can we find a solitary mention of Planat's name, but we are now given two pieces of information. The first is that Captain Maitland, the officer of the English Navy who commanded the "Bellerophon," wrote, on July 16th, 1815, as follows:—"I observed that Colonel Planat, who was devoted to Bonaparte, had, during breakfast, tears in his eyes, and seemed to feel acutely the situation in which his master was"; and the second is in a note quoted as appearing at the end of the "Mémorial de Sainte-Hélène," to the effect that "Colonel Planat, orderly officer, had followed us to Plymouth." As these extracts can doubtless be verified, we can accept the fact that Planat, unknown as he has been to the world until now, actually occupied the position the present publication claims for him.

The number of officers allowed to accompany the Emperor in his exile was limited by the English Government, and this subordinate officer, who, as is stated, had not been separated from his master since the days of Malmaison, was, to his great grief, refused permission to go. We learn that Planat's first interview with Napoleon had been at Weissenfels, during the campaign in Saxony in 1813, when the Emperor, desiring on one occasion to interrogate a peasant, called for an officer who could speak German; and Planat, who had learned the language at Berlin in 1807, acted as the interpreter. The historian utilises this short interview between Napoleon and the young officer to invoke a lengthy note in praise of that charm of the Emperor's personality, which was never forgotten by anyone who ever came under its influence. Planat appears to have been enslaved at once; and, in writing of the incident in after years, tells an anecdote of the meeting of Napoleon with Captain Maitland in the cabin of the "Bellerophon" as an illustration of the Emperor's graciousness of manner. Napoleon offered words



of consolation to the officers who could not sail with him, and Planat, in the suite of the Duke of Rovigo, was taken, as a prisoner of war, to Malta, where he remained some months.

From these prefatory remarks we see that Planat de la Faye, as a very young man, spent at most two years in the personal service of the great Napoleon, and in such a subordinate capacity that he could not of himself have added much to what is known of the Emperor. The interest of the memoirs now published lies, however, in the opportunities Planat had in his later life of gaining a knowledge of Napoleon's career through his long intimacy with members of the Imperial family; for had it not been for this connection certain erroneous statements which appeared in the memoirs of Marshal Marmont, published in 1857, might never have been corrected. We propose, therefore, to confine our remarks on the work, mainly to the circumstances connected with the employment of Planat in the household of Eugene Beauharnais.

Resolved to follow the Emperor to St. Helena, if a chance of doing so should offer, Planat obtained employment first as secretary to Jerome Napoleon, King of Westphalia. This did not, however, further his object, for some disagreement arose between his employer and himself, and it only resulted in his career being compromised, after Napoleon's death, by his being refused permission to re-enter military service under the Bourbons. At last he accepted with enthusiasm an appointment as aide-de-camp to Prince Eugene Beauharnais, whom he joined at Munich in 1822. Some speculations of a most astounding character made at this period relative to the supposed desire of Napoleon, when his divorce from Josephine was under contemplation, to re-marry with the Princess Augusta—the very person he had himself destined to become the wife of his brother-in-law, Eugene—are referred to by M. Vallery-Radot, and it would be interesting if the smallest foundation could be shown for the rumour to this effect, which was popularly spread. But whatever basis there might have been for it, the marriage of Eugene and Augusta took place in 1806, and Planat, at the period of his joining the Prince in 1822, describes their union as the continuous realisation of a long dream of happiness. It was, however, at this time apparently, happiness without wealth, for a salary could not be afforded for Planat at first, and he speaks of making dire shifts for food on the days when he did not dine at the table of the Prince and Princess. He was charmed with his reception by them, and commenced employing his leisure time in collecting books, engravings, and medals, with the object of amassing the materials which eventually would enable him to write a memoir of his great hero, the Emperor. Extracts from a letter he received from Queen Hortense, who had just read the work of O'Meara, contain the following words:—"All these horrible details must make you join me in regretting not having been able to go there (St. Helena) to console him." "It is a very painful thought that his family should have ceased to *tourmenter ce vilain ministre Anglais, as peut-être aurait-il été moins barbare.*" But Planat's happy days at Munich were all too short, for Eugene died suddenly, struck down with apoplexy, in 1824, to the very great grief of his aide-de-camp, who speaks of his late protector in glowing terms of admiration and esteem. "The high reputation of Prince Eugene," he writes, "is not soiled by a single blot." He continued for a few years in the service of the widow, henceforward known as the Duchess of Leuchtenburg, but retired eventually to Paris to end his days.

The tranquillity of his old age was disturbed by the publication in 1857 of the "Posthumous Memoirs of Marshal Marmont," containing grave imputations of treason in the conduct of Eugene, while Viceroy of Italy, in 1813.

Marmont, says Planat, having on his conscience his own defection from the Emperor's cause in 1814—which had produced such a public feeling of indignation that the very children in the streets of Venice pointed at him as the betrayer of Napoleon—endeavoured to transfer the odium from his own head to that of Eugene.

Marmont alleged that Eugene, in order to ensure his own position in 1813, wilfully disobeyed the Emperor's order to lead the army under his command into France, and stated that his not having done so was the most efficacious cause of the catastrophes which befel Napoleon, and led to his fall. In support of this accusation, the testimony of General Danthouard, one of Eugene's old aides-de-camp, is quoted. "This General," the Marshal wrote, "told me personally that being at Munich some time after the Restoration, he turned up, while working with the Prince arranging papers, the written order Eugene had received to execute the movement in question. 'Do you think, sire,' said he, 'it would be wise to preserve such a paper as this?' 'No,' replied Eugene, and he threw it into the fire."

Marmont's allegation was so precise and circumstantial that it was difficult to contradict, but Planat, who in 1837 was old and suffering, wrote at once to the *Siècle*, stating that he held absolute proofs of the entire baselessness of the accusation, and would lose no time in making them public. The three daughters of Eugene, who had become respectively Queen of Sweden, Empress of Brazil and Princess of Wurtemberg, had until this time been ignorant of the calumnies directed against their father. The Queen of Sweden, seeing Planat's letter in the *Siècle*, wrote to him in haste on behalf of the family, urging him to produce the proofs of Eugene's innocence as soon as possible. Three weeks after the publication of Marmont's memoirs, Planat issued a brochure containing copies of thirty documents which proved that the statement of the Marshal was unfounded and untrue. He stated that none of the Emperor's instructions to Eugene had been destroyed; but that all would be found in the archives of the Duchy of Leuchtenberg.

The correspondence would show that Napoleon had not ordered Eugene to evacuate Italy in 1813, but, in fact, had done the very reverse. Planat disputed the credibility of General Danthouard, affirming that this officer had fallen out with Eugene, and was never at Munich after the fall of the Empire.

As a new edition of Marmont's memoirs was about to be published, the Queen of Sweden made a formal demand that copies of all the Leuchtenberg papers should be inserted as an appendix to it, and that the accusation against Eugene should be withdrawn. The editor refused to comply with this request, and the Swedish minister in Paris was instructed to commence a *procès* in the French Courts of Law to compel him to do so. Planat undertook the exclusive direction of the action, and on the 27th July, 1837, the assertions of Marmont were pronounced by the tribunal to be unfounded, the editor of the memoirs being ordered to insert thirty-three documents produced at the trial. On an appeal being lodged, Planat solicited and obtained the consent of the Grand Duchess Marie of Russia to permit the production, as additional evidence, of the originals of documents in her hands, with the result that the former judgment was confirmed in a strikingly successful manner.

In his retirement as an invalid, Planat followed the events of the war in Italy, and the expedition under Garibaldi in 1860, with the closest attention. The well-known George Manin, who had enrolled himself in the service of the Chief, kept Planat *au fait* of the incidents of the expedition; and letters from Manin will be read with the attention contemporaneous accounts of exciting events must command from those who desire to form a sound opinion on any phase of the history of the past. In this case the letters of Manin are the more valuable, from the fact that they are annotated by a soldier of a past generation, who had himself served in the suite of Napoleon the Great.

Planat de la Faye, who had become quite blind, and been for a long time a prey to cruel sufferings, died in 1864, forgotten by everyone outside a small circle of intimates. The short accounts of his life which appeared in the public journals at the time attracted but slight notice, but the appearance of the memoir by M. Valléry-Radot will, it is to be hoped, ensure for his memory the modest measure

of fame it deserves. The work contains many interesting details, but our space is sufficient only to indicate those incidents in Planat's life which are likely to arouse public attention.

*Die Deutsche Reiterei in den Schlachten und Gefechten des Krieges von 1870-71.*  
von KUNZ, Major a D. Berlin: Mittler. Price 10s.

Major Kunz's book will prove invaluable to the student of cavalry tactics, whatever his nationality. In it he has analysed and recorded with singular fairness and impartiality the details of no less than 165 charges, 133 skirmishes, 51 dismounted engagements, and a whole number of incidents connected with the work of reconnaissance and security—a mass of material ample enough to form the basis of sound generalisation as to the actual value of cavalry services in the past.

In the introductory chapter he traces the successive steps in the evolution of the arm from 1815 to the commencement of the campaign in 1870, making use of Kaehler's "*Geschichte der Preussischen Kavallerie von 1806-1876*" for the bulk of his statements. Having shown us how the weapon was forged, he next tells us how it was wielded; and in his comments he is both open and fearless, boldly stating that though the material was excellent, the use made of it, particularly in the latter period of the war, was very inadequate.

In his final pages he gives us his views of the future, but as he writes for his own countrymen, who may be supposed to be thoroughly acquainted with the progress made in the interval, we as a nation are deprived of all means of estimating the correctness of his conclusions, for we cannot know the data on which he bases them.

Having followed the evolution of the Prussian cavalry with close attention during the past twenty years, we are of opinion that Major Kunz understates his case. The German cavalry in 1870 was not as well trained as regards horses and men in horsemanship and drill, neither was it as homogeneous in its constitution as he would have us believe.

Prince Hohenlohe, it will be remembered, fell into the same mistake in his "*Letters on Cavalry*," and was put right by his friend "von S." (General Senft von Pilsach), in the following words:—

"Our riding education keeps our horses during the whole of the winter on the level ground of the riding school and *manège*, from the 1st October to the 1st April. Then follow the squadron training and regimental drills, also on level parade grounds. Only during the short period of the detachment exercises and manœuvres, which last only four weeks, is it necessary for cavalry to ride straight across country, taking whatever comes first. Is it possible that the soldier trained under this system can feel full confidence that his horse will carry him safely as long as he sits close—doesn't jag at his bit? Is it to be expected that he can keep his eyes on the enemy and his squadron leader? Is it not much more likely that he will be anxiously looking down at every stone and furrow on the ground, and at the same time keep worrying his horse's mouth, and thereby destroying the order of the formation? But a leader who has grown up in this groove, how can he feel confidence in the ability of his men to reach the enemy closed up, when he knows that every ridge and furrow loosens their order?"

This is, of course, not to be taken too literally, for the war of 1870 certainly showed a somewhat higher standard; but it is unquestionable evidence that in the opinion of competent critics the German cavalry was far below the level they have now reached, though even this level will be exceeded before many years.

Summing up the whole of our impressions derived from experience, we should be inclined to rate the chances of a German brigade or division reaching their objective in properly closed-up form as, at least, tenfold greater than it was in 1870; and the endurance of their horses, both for patrolling and for covering long distances at speed, is at least double what it was then.

If this generalisation is true, then, as regards the activity of cavalry on the battle-field, human nature having remained much where it was previously, if indeed it has not deteriorated, the prospects of the arm in the future have been placed by our author at far too low a level.

It is to the account of the cavalry actions on the day of Vionville that the reader will naturally turn first. Unfortunately, it is far too long, and given with too minute detail to reproduce here; but we hope ere long to be able to publish a complete translation of it. The following few extracts are, therefore, made to afford some idea of the contents of the book, and the impartiality of the writer.

Analysing the instances of surprise of small detachments—not very numerous, when the numbers engaged are remembered—he calls attention to the fact that in almost every instance the party surprised was in a *Wirthshaus*, whither they had adjourned from sheer force of habit.

Summarising the results of all the charges ridden, and classifying them according to the size of the bodies engaged, he notes the extraordinary difference between those in which regiments and larger bodies took part, and those initiated by squadron leaders and lieutenants on their own responsibility—a difference altogether disproportionate to the relative numbers of the higher and lower units in the whole organisation. Commenting on this difference, he makes the following very appropriate remarks, which apply with great force to the conditions existing in our own Service:—

“The subaltern and squadron leader attack whenever and wherever they get the chance. The senior officers naturally were more circumspect, for obviously the responsibility of committing a regiment or brigade to a decisive action is a very serious one. The certain losses must be weighed against the more or less uncertain results. Still, it would seem as if the unfavourable verdict so often pronounced on cavalry attacks in our peace manoeuvres exerted here their baneful influence. The unconditional confidence in their arm, that supplied the real motive power to men like Seydlitz, Ziethen, and Kaetzeler, seems to have been wanting in 1870-1.

“Here lies the error. Here, and in the complete want on the part of our leaders in the indispensable practice of handling large masses of cavalry. No want of courage can be laid to our charge. Nowadays, thank God, all this is different. But things would be still better if, in peace time, our cavalry Divisions were maintained as organic units. The leader must know his subordinates, and his men; he must have tried and tested them again and again, if he is to achieve anything really great with them, and the troops must know their leader, and trust him blindly.

“Practice, practice, and yet again practice, and the right men in the right place; therein lies the true secret of victory. Give us this, and in future wars our horsemen will again score up results far above existing expectations.”

Two other instances in this book are of such an unusual nature, and moreover, illustrate so graphically the all-importance of the unconditional obedience of the horse to the rider, that they cannot be omitted:—

A Prussian patrol was marching down one of the long, broad *chaussées* so common in France, when they saw a French detachment retiring before them, and immediately gave chase. The French, being presently joined by their supports, turned and came at them in overpowering force, and the Germans promptly went threes about and galloped away. The French pursued hotly, and suddenly the Germans discovered another strong detachment, which had intercepted their retreat on the road, and who were also galloping to meet them. The Germans held on until the distance between the two French troops was reduced to less than a couple of hundred paces, then wheeling sharp to their left, jumped the road ditches out into the fields, whilst the two French detachments, their horses entirely out of hand, dashed violently into one another, and an indescribable scene of

confusion arose ; a German support arriving in the nick of time, took the whole party prisoners. Comment on this is surely unnecessary.

The other is, perhaps, even more remarkable. A French cavalry regiment was advancing towards the enemy along the high road. For some reason the Colonel had been detained for a few moments, and the regiment had passed him. Cantering forward, something at the head of the column attracted his attention, and he quickened his pace in order to remedy it. He was a bad rider, on a badly-broken horse, and once having started him going he could not pull up. The horses in the column becoming alarmed by the rapid passage of the chief, became excited and began to plunge, and the leading files, seeing their leader dash past them at speed and mistaking the import of the instructions he endeavoured to shout at them, conformed to his pace, and presently the whole regiment was galloping down the road in the wildest run-away towards the enemy, who happened to be advancing.

For a moment the Germans were at a loss, but presently realising the position of affairs they cleared off the roadway they had been occupying, formed up in the fields on either side, and when the whole French column was well in the trap poured in a heavy fire from both flanks ; which, it may be noted in passing, did not by any means annihilate the enemy, who ultimately fell into the hands of other troops further down the line of march. This is not an isolated instance, for an exactly similar one happened a few hours later, and within a few miles of the same spot.

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*La Défense des Etats et la Fortification à la fin du XIX. siècle.* By GENERAL BRIALMONT. 8vo. ; with atlas, 4of. Brussels, 1895.

It is thirty-two years since General Brialmont published his first important work on this subject, in which he explained and indicated the principles which had been in course of application for some years previously at Antwerp. But the Antwerp works belonged to the time of transition from smooth-bore to rifled guns ; the powers of the latter were not sufficiently appreciated, and in the course of the next ten years he brought out two fresh books to supply the necessary rectifications for low sights and high sights respectively. At the end of another ten years high angle fire from howitzers and mortars had been so much developed that a fresh revisal was called for, and in 1885 he published *La fortification du temps présent* with this object. But in the two following years the experiments in Germany and France with high-explosive shells gave alarming results, which obliged him once more to re-cast his projects. He threw out some suggestions as to the way of meeting the new danger in 1888, but the present work is meant to deal with it more definitively, and by the light of fuller experience.

Twelve stout volumes of text with seven atlases of plates are his contribution to the study of permanent fortification, not to mention some minor works ; and whether we adopt his conclusions or not, everyone who is interested in the subject must be grateful to him for the stimulus of his ever-varying suggestions, and for the industry with which he has swept together all the material facts, and noted every step of progress.

He has not had the advantage of personal experience in war ; but no man has had such extensive experience in the actual design and execution of works under widely different conditions. This is a wholesome corrective of a too exuberant fancy ; and the practical value of it is often shown in his incidental hints on the construction of retaining walls, etc.

If his designs strike one, nevertheless, as too grandiose, and too heedless of estimates, it must be remembered that the special conditions of our own national defence are apt to lead us into the opposite extreme, and that after all the Twydall redoubt is not the last word in fortification.

The first two chapters of the present volume deal with the defence of frontiers in general, and the merits of fortified districts, formed by a group of fortresses, and with a perimeter which precludes investment. They were the subject of a special study which he published in 1890. He gives the Venetian and Bulgarian quadrilaterals as instances, and adds an imaginary example in the north frontier of France, formed by Landrécies, Cambrai, Valenciennes, Maubeuge, and Le Quesnoy. The scales of the two former plans, by-the-bye, are misappropriated. He argues that such groups offer a much more powerful defence than the combination of two intrenched camps with an intermediate curtain of barrier forts, adopted by the French on their east frontier; but while the minor stars of the constellation will no doubt have a certain value when they happen to exist, they are not likely to be provided for the mere chance of a strategic use.

The lesson of Metz and the alternatives open to Bazaine are discussed at some length. He remarks that it would have been a good thing for the Prussians in 1806, if Magdebourg had been a place like Metz in which their shattered armies could take refuge; but this is hardly consistent with his opinion that Bazaine should have left Metz before he was invested. Napoleon spoke of Magdebourg at the time as a mouse-trap, and with such odds as there were after Jena it could hardly have altered the results of the campaign if it had been a larger mouse-trap.

In the chapters on details of construction, which form the bulk of the volume, General Brialmont is mainly in agreement with the French semi-official *Manuel de fortification permanente*, of which an abstract has been given in the January and subsequent numbers of this Journal. It represents the present teaching in the French military schools. He claims credit for having been the first man to place a cupola on a fort. France and Germany have followed his example; but he has himself gone far beyond anyone else in the forts on the Mense. Cupolas are the central feature of the designs in this book. He adopts four calibres for the armament of his forts: 8½-inch mortars and howitzers, 6-inch and 4¾-inch guns, 4¾-inch Q.F. howitzers, and 2¼-inch Q.F. guns (6-pounders). Some of the Q.F. guns would be kept in shelters on field carriages, and used only in case of an assault; all the rest of the armament (except the pieces flanking the ditches) would be in cupolas. The high angle fire concentrated on a fort would soon disable any pieces that have no overhead cover, whether on barbette or disappearing mountings; and the defects of the earlier cupolas have, he maintains, been got over. High explosive shells produce no greater effect upon them than powder shells. He does not favour the disappearing type—of which the Galopin turret, adopted by the French, is the latest and best example—except for light Q.F. guns. To show that the cost of cupolas is not prohibitory, he gives the results arrived at by Colonel Wagner, from an elaborate comparison between the type of fort built at Liège and Namur and the old-fashioned type. The latter would have required larger forts, more guns, and garrisons of twice the strength; so that Wagner concludes the saving has been very considerable.

But the average cost of the Mense forts is high, about £135,000; and the question remains, admitting that all pieces permanently mounted in forts should be in cupolas or casemates, Why should any pieces be so mounted except Q.F. guns? General Brialmont gives no satisfactory answer to this question. It seems altogether a mistake to place mortars and howitzers in positions where the enemy's shells are sure to fall thickly, and where they get no advantage to compensate. For guns that are to be laid directly, and need a good field of view, the salients of a fort have much to recommend them; but why should such guns be any larger than is necessary to secure efficient shrapnel? It is for dealing with moving objects that they are indispensable; the destruction of works and dismounting of guns will be better done by fire at higher angles and with shells of larger capacity.



General Brialmont gives an Austrian experiment of fire at a four-gun siege battery, at a range of  $1\frac{1}{4}$  mile. Out of fifty shells from an  $8\frac{1}{2}$ -inch howitzer eight fell in the battery, and did so much damage that it would have taken longer to repair it than to make a new one. Eighty shells were fired from a 6-inch gun at one gun of this battery; they cut a shallow trench in the parapet, but did no harm to the gun, and only three gunners were hit. The destruction of the iron shields, which the besieger is likely to use in future for his batteries, is given by General Brialmont as the special function of the 6-inch guns; but this might surely be left to high-explosive shells from howitzers, which would displace the earth around and beneath them.

He says that the French have decided to keep on the ramparts of their forts only Q.F. guns in disappearing cupolas. A few long-range guns will be placed there without overhead cover to hinder the investment; but they will be withdrawn and transferred to the intervals between the forts as soon as the investment is completed. This decision seems sound.

General Brialmont argues, with a good deal of force, that the introduction of smokeless powder and other recent changes have on the whole told in favour of the defence. As a general rule he adopts counterscarp walls and casemates, instead of escarp walls and caponiers. He still maintains that a good fort should have a keep; but the huge monolith of concrete, which the keep has now become, looks far more likely to paralyse the defence of the fort than to prolong it.

He is more successful in his argument on behalf of an interior enceinte for an entrenched camp, not to stand a regular siege, but to stand assault. He points out that the Germans have made a new enceinte for Cologne, and extended that of Strassburg since 1871; and that only two years ago the *Conseil supérieur de la guerre* was unanimously against the demolition of the enceinte of Paris.

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*The Life and Correspondence of Sir Bartle Frere, Bart., G.C.B., F.R.S.* By JOHN MARTINEAU. London: John Murray, 1895. 2 Vols. Price, 32s.

It is not often that the task of writing the biography of a great man falls into such competent hands as those of Mr. Martineau. Too often, by the very nature of its greatness, an object towers so high above the level of its surroundings, that one possesses no scale by which to measure its greatness; or, by the fore-shortening inseparable from proximity, we distort its outlines altogether. Only by degrees, as time removes us further from the scene of action, do the true proportions of the results achieved loom out above the lesser deeds of contemporaries.

The book falls naturally into two main divisions—Sir Bartle's work in India and in South Africa—and it is with the first of these that we propose chiefly to deal, for the latter involves controversial matter to an unusual degree. Briefly, the first part is an historical summary of the causes at work in our Indian Empire, which have led to the evolution of our power in that country as we now find it; and, from this point of view, it is worth the most attentive study of all classes of Englishmen, and we would specially recommend it to those who may have been pessimistically influenced by the predictions of Mr. Charles Pearson; for the lesson this work teaches us is, that character, combined with honesty of purpose, triumphs over all difficulties.

The point is, to appreciate what constitutes character, and how to apply it to the best advantage. The answer to the first point may be read between the lines by all who will take the trouble to really study this book; to the second, in the following letter of Frere's, with Mr. Martineau's comments on it:—

"January 15th, 1858.

"The question on which I have the misfortune to differ in opinion from Government lies within a very narrow compass, but it is one of immense importance in every department of the administration. It is, simply, whether the Government shall be centralised by giving exclusive power and responsibility to



individual officers within given areas, or whether the centralisation shall be by departments, all dependent of each other, and owning no common authority inferior to the Government.

"The former is the old system of Oriental and of all other vigorous despotisms; the latter is a system generally incompatible with vigorous government of any kind, and an almost constant source of complaint, even in the free representative governments where it originated. The former built up our Indian Empire, while we maintain a really efficient chain of responsibility and individual authority, from the Governor in Council down to the village Patel; the latter paralyses all such individual authority and responsibility by departmental wires pulled from the governing centres. It is a very recent introduction into India that already threatens to destroy the whole fabric of our power. Both systems aim at centralisation, but the one attains real and efficient centralisation as long as there is force at the centre; the other becomes deranged by the slightest trial or shock, and unless in seasons of difficulty some man is bold enough to break all rules, and assume, at his own peril, the individual local authority—which the other system spontaneously gives—the results are invariably disastrous.

"The principle which Frere here lays down, that, as a captain must be master on board his own ship, so a ruler must have authority over, and be responsible for, all departments within his own jurisdiction, is one which he will henceforth be found constantly battling for as essential to all good administration. He contended for it with equal zeal on his own behalf when in charge of a province, and on behalf of others when he himself was on the Council of the Governor-General in Calcutta, Governor of Bombay, and on the Indian Council in London. To his own subordinates he extended the fullest powers, and gave the amplest discretion; he claimed like treatment for himself. Neither the work that he did, nor the methods he pursued can be understood and appreciated, unless it is constantly borne in mind how his whole system of administration was pervaded by this principle of conferring on each officer a large discretion and ample freedom of action within an assigned area, thereby forging a chain of personal and individual responsibility ascending from the highest to the lowest."

To any man conducting some great commercial enterprise, indeed to anyone not acquainted with the "behind the scenes" of Service official life, the above must seem the veriest platitude and truism ever penned, for they all conduct their business on this system, and when they do not they promptly go bankrupt. The point they miss is this, that whereas a going business concern is, so to speak, always on a war-footing, fighting other competitors; our armies and governing offices generally are usually on a peace footing—only rarely on a war footing. All human organisations tend naturally to fall into the groove, which for the time offers least resistance to the lower ranks, for these are not kept screwed up to concert pitch by the hope of palpable reward or the fear of immediate expulsion. The ambitious, hard-working men who in time of peace make their way to the front, find too little to occupy them, and insensibly begin to encroach on their subordinates' dominion; the casual imbeciles who survive by mere seniority, fail to supervise, and necessitate the interference of the head offices to avert absolute chaos. The difficulty is to find the man who can appreciate the true relative value of the position he momentarily holds, and who never forgets in times of ease that the strain may come any day, when all will depend on the initiative of those junior officers it is the essential duty of his position to train.

If we were always working at high pressure this trouble would never arise, but Government officials and officers would fall into their places as naturally as bank clerks and others. It is the capacity to grasp this essential difference in the two situations that is so rare, and when we find it so conspicuously present as in the case of the man whose life now lies before us, we are justified in placing his memory on a very high pedestal indeed, irrespective of the apparent outcome of his actions, even the bias (if any) of his biographer.

*Organisation and Tactics*: By Captain ARTHUR L. WAGNER, Instructor in the Art of War at the U.S. Infantry and Cavalry School. London and New York: Westermann and Co., 1895.

This book can be strongly recommended, not only because Captain Wagner has thoroughly studied the works of the leading Continental tacticians, but because he has imported originality into his work, by comparing the views and practice of the American leaders with those sanctioned by European experience. Owing to the omission of this essential feature on the part of other authors, nine-tenths of their work falls short of the value of even waste paper, for their conclusions, based on too narrow a range of observation, have led to nothing but confusion in their readers' minds.

The Franco-German War, owing to its short duration, the inequality of armament, and the rapid deterioration of the beaten side, presents more pitfalls for the average student than perhaps any other campaign in history; and these pitfalls can only be avoided by carefully checking each conclusion, before definitely registering it, by comparison with the scale of previous experience, the nearer to the present time, of course, the better.

This scale the records of the American War supplies us with. Its duration was sufficiently long, and perhaps no other war was ever fought out in which the uniformity of the conditions on either side varied relatively so gradually. Unfortunately, the historians who chronicled it were not for the most part tacticians, and hence the details which really interest the fighting soldier are unusually hard to come at, more particularly for the British officer.

The historical sections, showing the gradual evolution of each of the three arms and their combined employment in action, show very considerable research, and are of great interest. Unfortunately, time and space both fail us, to do them full justice, but the passage in the chapter on infantry tactics in the American War is of such universal interest that we give it below in full.

"Though the attack formations varied considerably in matters of detail, the following may be given as the one so generally used as to constitute practically a normal formation. The Division was formed in three lines of deployed brigades, at distances varying from 150 to 300 yards, the leading brigade being preceded by one, or sometimes two lines of skirmishers. The skirmishers being reinforced by, and absorbed in, the first line, and the latter if checked being reinforced and pushed forward by the second; and the third line being, if necessary, similarly absorbed, the assaulting force at the moment of collision, generally consisted of all the successive lines merged into a dense and irregular one."

Those who have followed the evolution of the present German infantry tactics will recognise at once the similarity of the two methods, nor will the resemblance to the British attack at the Alma, which Moltke so unsparingly condemned, escape them.

*The Great War with Russia: The Invasion of the Crimea.*—A Personal Retrospect of the Battles of the Alma, of Balaclava and Inkerman, and of the winter of 1854-5. By W. H. RUSSELL, LL.D. London: George Routledge and Sons. Price, 5s.

A most interesting book, specially valuable to tactical students for the direct testimony given as to the conduct of the troops in the several actions.

It is a universally accepted axiom of tacticians, that losses are more or less demoralising in proportion to the limit of time in which they are inflicted. Unfortunately in describing the scenes he witnessed, Dr. Russell too often forgets to give us the duration in point of time, and hence his evidence is deprived of much of its value. For instance, nine-tenths of the current ideas on tactics are based on the assertion that the losses incurred in the Franco-German war, were entirely unprecedented, and from this false premise it has been deduced that some

alteration in our tactical formation is required, in order to enable our men to face the fire of the breech-loader.

Actually the percentage of loss in many British regiments, both at Inkerman and the Alma, was equal to, if not greater than, those suffered by any German regiments, except the 57th and 16th at Mars la Tour.

Reading between the lines, it is very apparent that in almost every instance the period of exposure to fire in the Crimea was markedly less than in 1870, hence the conclusion follows that the nervous strain on the men must have been proportionately greater. Yet whole Divisions and Corps did not disband under the death-dealing rain, as German officers admit they did in the French war; and since we believe that the difference in sheer fighting value between the raw material of any two races is exceedingly slight, depending practically on the training of the men in peace time, the conclusion to be drawn would appear to be that no case has been made out for the necessity of modifying our traditional method of fighting in line, by those who maintain that the inherent weaknesses of flesh and blood compel us to employ extended order if our men are to be able to advance at all. Probably the advance from the bed of the Alma until the final repulse of the Russian counter attack did not entail more than thirty minutes' exposure to fire, yet in spite of the crowding of losses into that short space of time the troops retained sufficient cohesion to effect their purpose—a result never since obtained by infantry taught to fight in independent order and company columns.

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*Grundriss der Taktik.*—Third revised edition of "Elemente der Taktik." By Major-General J. MECKEL. Berlin, 1895. Mittler.

This book differs very essentially from the original *Taktik* by the same writer, which in the main contained the author's own opinions on the employment of troops in war, and was in no sense official. The work before us may be described as a digest of the official views on the employment of the three arms compiled from their several regulations. This is enough to indicate that no officer of any one arm will find it entirely to his liking, for until human nature alters very considerably regulations compiled by committees will never be free from contradictions.

One cannot altogether restrain a thrill of compassion for the author in his bureaucratic task. Left to himself, in a position of greater freedom and less responsibility, he conveys his meaning to the reader in strong, vigorous language, carrying with it the sting of conviction; but clad in the orthodox garb of officialism one is conscious of the inward struggle seething within him as time after time he denies his most cherished convictions. Yet the book must be read by all who would follow the internal revolution in progress in the German Army.

One special point in the historical section (which very inconveniently is placed at the end of the volume) deserves to be brought out, for it seems to be the official recantation of his heretical declaration in the "Summer-night's Dream." Describing the Line tactics of Frederick the Great's era, he confounds the form into which forty years of drill ground practice had degraded them, with the spirit that ten years of active service in the Peninsula, the teachings of Sir John Moore and of Wellington's lieutenants had evolved out of them. The Prussian line trained on the Tempelhof fields had shown itself to be slow, unwieldy, and unadaptable to the ground at Jena and Auerstadt. The British line trained under Sir John Moore at Shornecliffe, and subsequently on active service in the field in the Peninsula, at Waterloo and in India, showed none of these disadvantages; nay more, when transplanted across the Atlantic it proved itself better adapted all round to the needs of desperate fighting than any variation of it that could or can be suggested. There is the strongest reason to believe that even now in Germany many officers of great experience in the fighting line would gladly go back to the old model, modified of course to suit existing circumstances; but in face of this

official confusion of thought, of which Meckel is here the exponent, they are compelled to restrain their desires and to accept a hybrid formation for fighting, which practically leaves it open to each individual man to choose whether "he will obey his officer or not"—these being, in fact, Meckel's own words in his unsigned pamphlet.

*Britain's Naval Power.* By HAMILTON WILLIAMS, M.A. London: Macmillan and Co.

Mr. Williams disarms criticism by stating in his preface that he claims "no special fitness."

No doubt it is difficult to compress into one volume the whole history of the Navy, and in this case the result is a work of what is usually called a "popular" character.

It is a misnomer to call the Navy "our first and only real line of defence." The rôle of the Navy is offensive: not on these shores, which can be perfectly well left to the Army, but against our enemies on their coasts.

Mr. Williams' views with regard to Elizabeth can hardly be called historically accurate. Her title to the throne was, birth apart, confirmed by Parliament, and to look upon her Protestantism as objectionable is—considering the then political situation—ridiculous. To speak of her as a "weak woman," and six lines after to say that she "was equal to the task before her," is contradictory.

Moreover, he does not appear to appreciate that in her reign it was that the foundation of our sea power was really laid—the beginning of that naval force which Blake subsequently led on to victory. To talk of the great Queen's "parsimony," and to attribute the exhaustion of powder to her special fault, is to attribute to her the part of the "everlasting nigger." Mr. Williams might as well lay at Queen Victoria's door the want of ammunition after the battle of Alexandria.

At page 124 we are told that one result of the war which ended with the Treaty of Paris was that "the supremacy of the British nation at sea had been asserted beyond power of contradiction," forgetful of the events which took place between 1775-83.

At page 249 we have once more brought forward the notion that Trafalgar altered Napoleon's views with regard to the invasion of England, totally regardless of the fact that the Emperor's troops crossed the Rhine six weeks before this sea battle was fought.

When the author confines himself to a compilation of well-known facts his book is not without interest, but when he gives his views on contemporary history he is usually misleading.

The book is well illustrated and is not without value, although it contains nothing that is new; but it will scarcely be regarded by those who are acquainted with the subject as adequate to the somewhat ambitious position it was desired to occupy.

*Highland Light Infantry Chronicle.*

This is another of the excellent periodicals which have in recent years become an institution in the Army, and the editor has kindly sent a complete set from the commencement of the paper in January, 1893. These papers form a permanent record of regimental events, which, in ordinary circumstances, would in course of time be lost sight of and forgotten. They cement a feeling of friendship and encourage *esprit de corps* between the four battalions of the regiment—the old 71st H.L.I., the 74th Highlanders, and the 1st and 2nd Royal Lanark Militia—and, upon all grounds, are worthy of encouragement, because they are frequently well written and well illustrated. The Council of the Royal United Service Institution will be glad to receive from other regiments copies of their periodical publications.

R. H.





J. J. K. & Co., LONDON.

For Particulars, see Naval Notes, page 632.

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